

Submit 1 System Validation Plots

	System Validation Plots
	Project name :
	KS100408B01

EUT DESCRIPTION

Product:	Connected PND
Model:	PA02-5001/PA02-5002/PA02-5003/PA02-5004/PA02-5005/PA02-5006 /PA02-5007 /PA02-5008 /PA02-5009 /PA02-5010 /PA02-5011 /PA02-5012
Trade name:	N/A
FCC ID:	VUP-A0201P
Tested:	April 9, 2010
Applicant:	YF INTERNATIONAL LIMITED 17F, Zhongke Building, China Academy of Science & Tech Development, High-Tech South Street 1, Shenzhen, China 518057

Air Temperature: 21 °C Liquefied Temperature: 20 °C
Crest Factor: CW: 1 GSM: 8 GPRS 12 2
Area Scan: 7 x 7 x 1 dx=15mm dy=15mm
Zoom Scan: 5 x 5 x 7 dx=5mm dy=5mm dz=5mm
Z Axis Scan: 1 x 1 x 21 dx=20mm dy=20mm dz=5mm
Probe: Antennessa (SN:SN_1109_EP_100)

Compliance Certification Services (Kunshan) Inc.
No.10, Weiye Rd., Innovation Park, Eco & Tec. Development Part,
Kunshan City, Jiangsu Province, PRC.
TEL: 86-512-57355888
FAX: 86-512-57370818
<http://www.ccsrf.com>

850 BODY VALIDATION

I. RESULTS

	<u>TYPE</u>	<u>PARAMETERS</u>
<u>GSM850</u>	<u>Noise</u>	--
	<u>Validation</u>	<u>Measurement 1:</u> Validation Plane with Dipole device position on Middle Channel in CW mode
	<u>Phone</u>	--

MEASUREMENT 1

Type: Validation measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 6 minutes 51 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

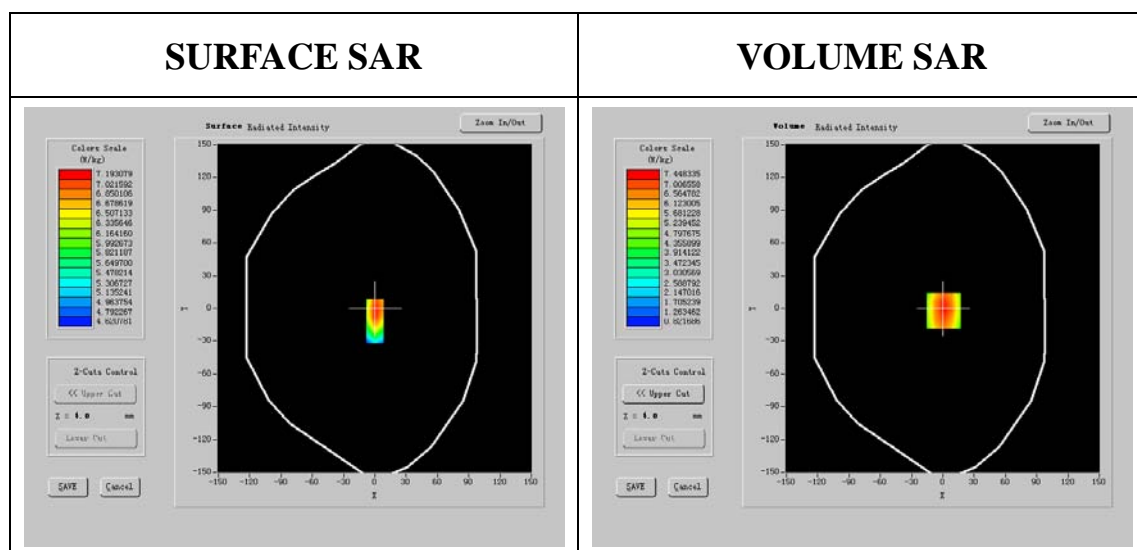
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Dipole
Band	GSM850
Channels	Middle
Signal	CW

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

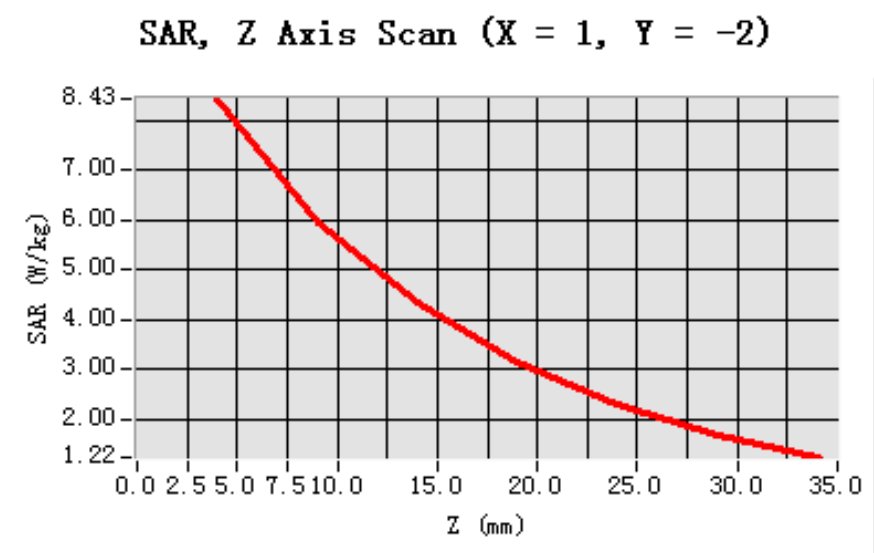
Frequency (MHz)	835.000024
Relative permittivity (real part)	54.809816
Relative permittivity (imaginary part)	22.123529
Conductivity (S/m)	0.961389
Variation (%)	0.200000



Maximum location: X=1.00, Y=-2.00

SAR 10g (W/Kg)	6.223652
SAR 1g (W/Kg)	9.606625

Z Axis Scan



1900 BODY VALIDATION

I. RESULTS

	<u>TYPE</u>	<u>PARAMETERS</u>
<u>GSM1900</u>	<u>Noise</u>	--
	<u>Validation</u>	<u>Measurement 1:</u> Validation Plane with Dipole device position on Middle Channel in CW mode
	<u>Phone</u>	--

MEASUREMENT 1

Type: Validation measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 6 minutes 43 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

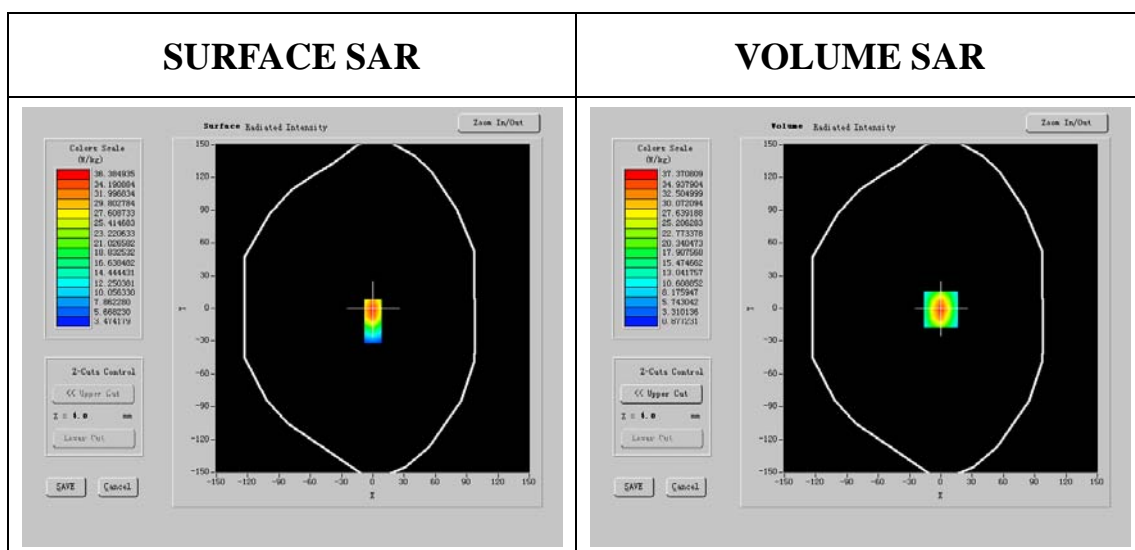
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Dipole
Band	GSM1900
Channels	Middle
Signal	CW

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

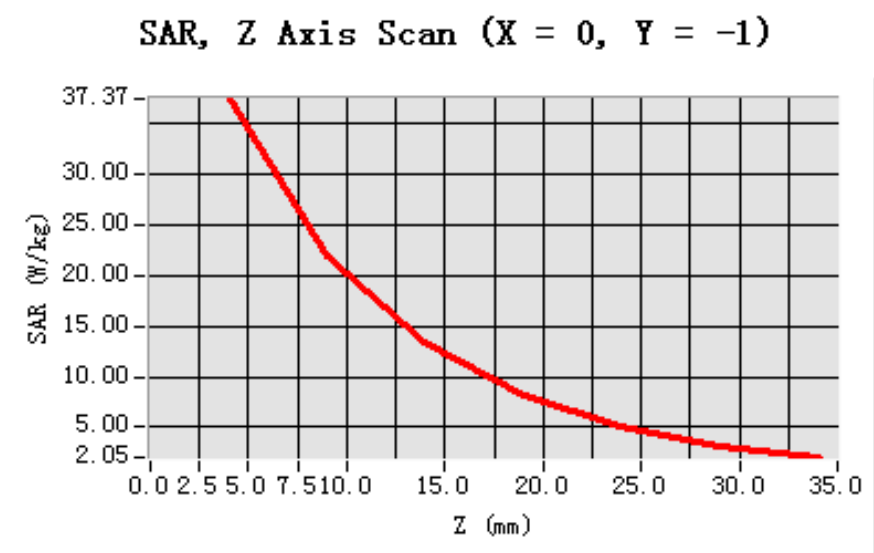
Frequency (MHz)	1950.000000
Relative permittivity (real part)	52.293464
Relative permittivity (imaginary part)	13.671000
Conductivity (S/m)	1.487120
Variation (%)	-0.550000



Maximum location: X=0.00, Y=-1.00

SAR 10g (W/Kg)	18.712125
SAR 1g (W/Kg)	38.987124

Z Axis Scan



Submit 2 SAR Test Plots

	SAR Test Plots
	Project name :
	KS100408B01

EUT DESCRIPTION

Product:	Connected PND
Model:	PA02-5001/PA02-5002/PA02-5003/PA02-5004/PA02-5005/PA02-5006 /PA02-5007 /PA02-5008 /PA02-5009 /PA02-5010 /PA02-5011 /PA02-5012
Trade name:	N/A
FCC ID:	VUP-A0201P
Tested:	April 9, 2010
Applicant:	YF INTERNATIONAL LIMITED 17F, Zhongke Building, China Academy of Science & Tech Development, High-Tech South Street 1, Shenzhen, China 518057

Air Temperature: 21 °C Liquefied Temperature: 20 °C

Crest Factor: CW: 1

GSM: 8

GPRS 12 2

Area Scan: 7 x 7 x 1

dx=15mm

dy=15mm

Zoom Scan: 5 x 5 x 7

dx=5mm

dy=5mm

dz=5mm

Z Axis Scan: 1 x 1 x 21

dx=20mm

dy=20mm

dz=5mm

Probe: Antennessa (SN:SN_1109_EP_100)

Compliance Certification Services (Kunshan) Inc.
No.10, Weiye Rd., Innovation Park, Eco & Tec. Development Part,
Kunshan City, Jiangsu Province, PRC.
TEL: 86-512-57355888
FAX: 86-512-57370818
<http://www.ccsrf.com>

GSM850

I. RESULTS

<u>TYPE</u>	<u>BAND</u>	<u>PARAMETERS</u>
<u>Noise</u>	--	--
<u>Validation</u>	--	--
<u>Phone</u>	<u>GSM850</u>	<u>Measurement 1:</u> Validation Plane with Body device position on Low Channel in GSM mode <u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in GSM mode <u>Measurement 3:</u> Validation Plane with Body device position on High Channel in GSM mode

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

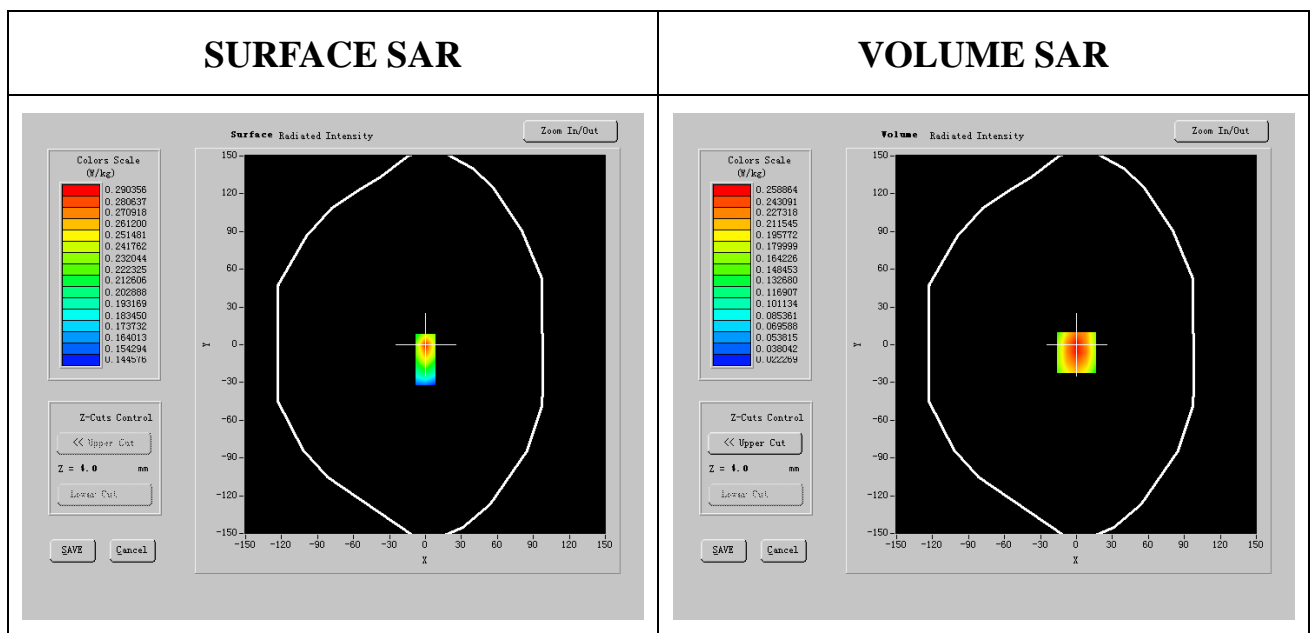
Phantom File	surf_sam_plan.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Low
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

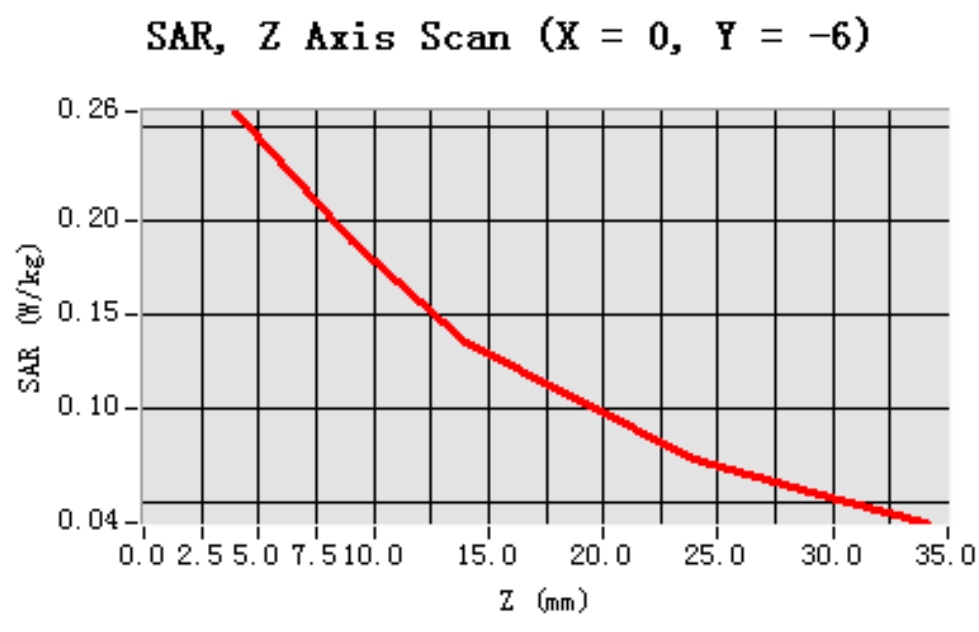
Frequency (MHz)	824.200012
Relative permittivity (real part)	54.514000
Relative permittivity (imaginary part)	21.654150
Conductivity (S/m)	0.964519
Variation (%)	-1.120000



Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.157342
SAR 1g (W/Kg)	0.234114

Z Axis Scan



MEASUREMENT 2

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

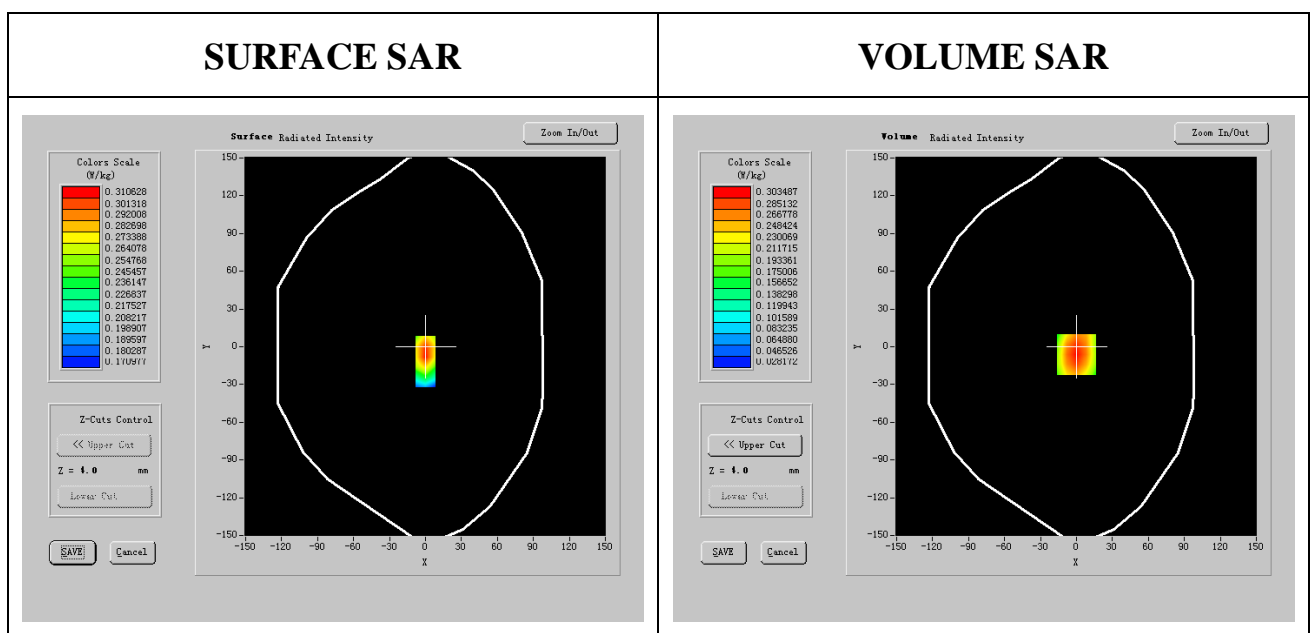
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	Middle
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

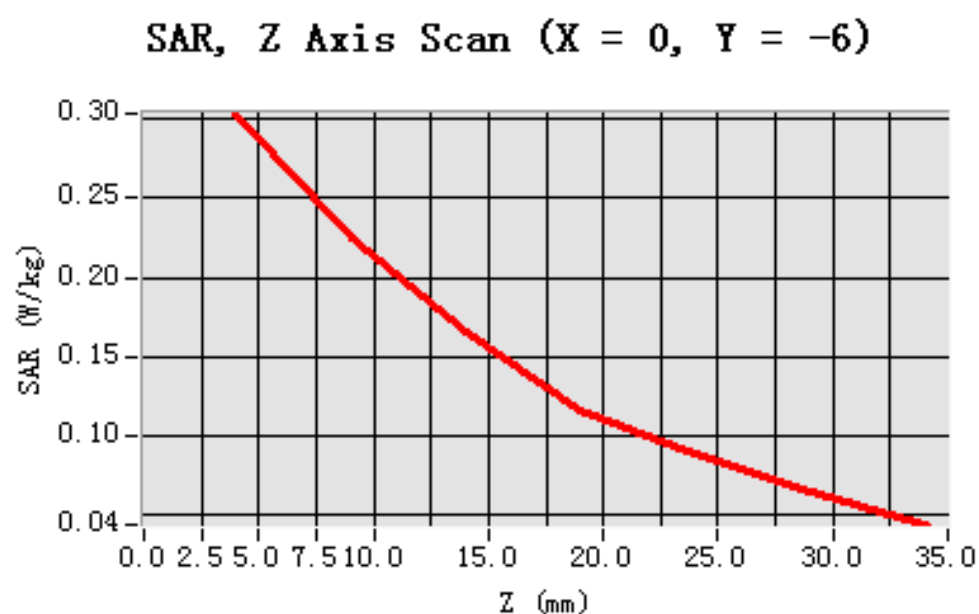
Frequency (MHz)	836.400024
Relative permittivity (real part)	54.701935
Relative permittivity (imaginary part)	21.866249
Conductivity (S/m)	0.966052
Variation (%)	-1.120000



Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.174721
SAR 1g (W/Kg)	0.272374

Z Axis Scan



MEASUREMENT 3

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

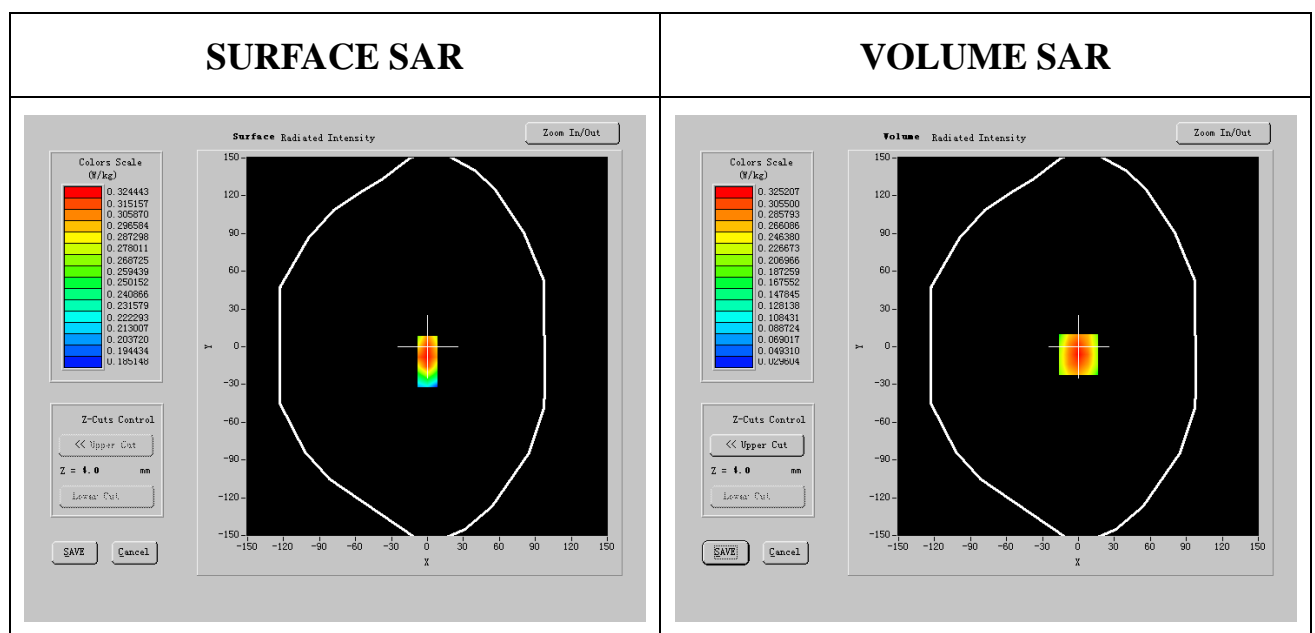
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM850
Channels	High
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

Frequency (MHz)	848.599976
Relative permittivity (real part)	54.850231
Relative permittivity (imaginary part)	21.726601
Conductivity (S/m)	0.973288
Variation (%)	-1.000000

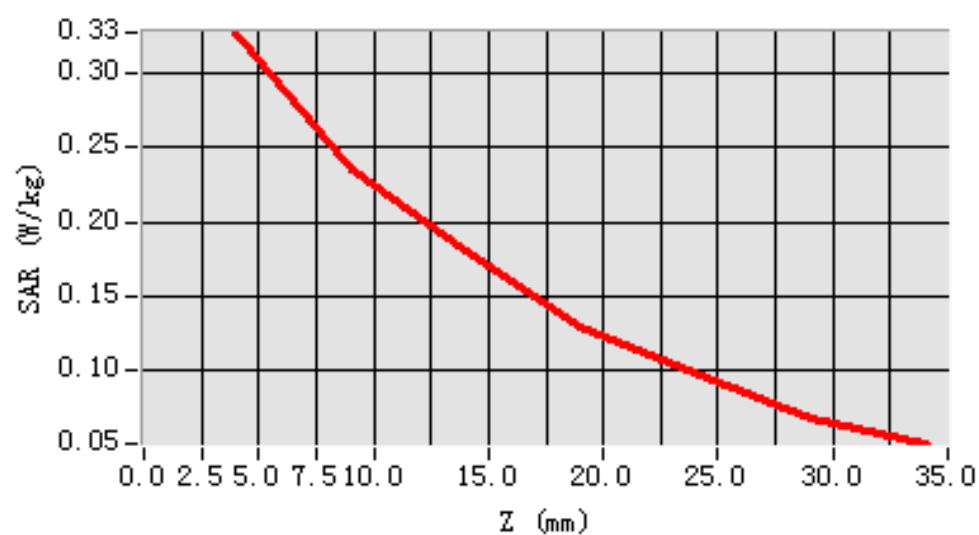


Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.183581
SAR 1g (W/Kg)	0.296219

Z Axis Scan

SAR, Z Axis Scan (X = 0, Y = -6)



GSM 1900

I.RESULTS

<u>TYPE</u>	<u>BAND</u>	<u>PARAMETERS</u>
<u>Noise</u>	--	--
<u>Validation</u>	--	--
<u>Phone</u>	<u>GSM1900</u>	<u>Measurement 1:</u> Validation Plane with Body device position on Low Channel in GSM mode <u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in GSM mode <u>Measurement 3:</u> Validation Plane with Body device position on High Channel in GSM mode

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 44 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

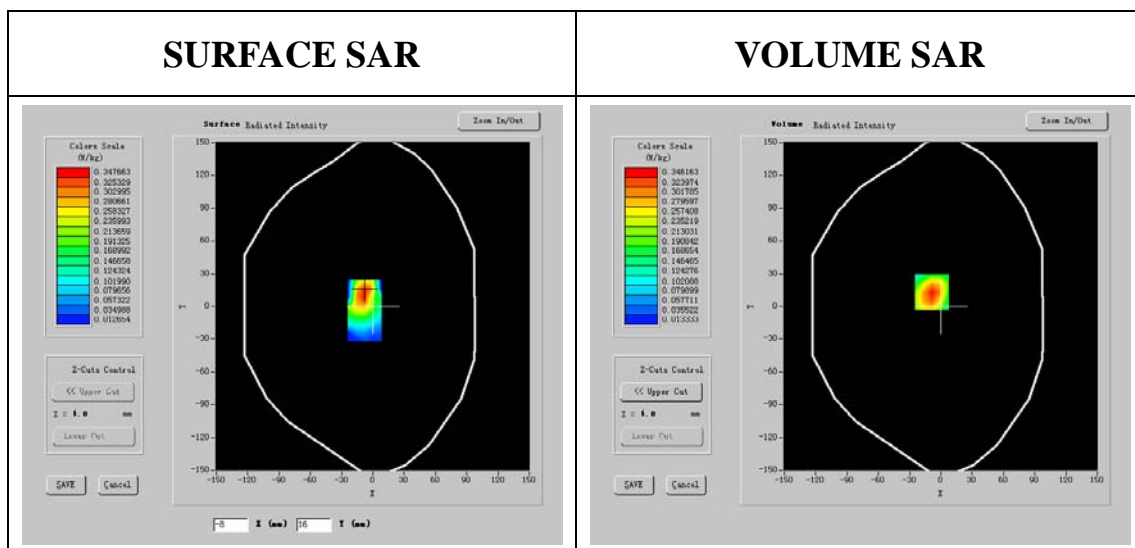
Phantom File	surf_sam_plan.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Low
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

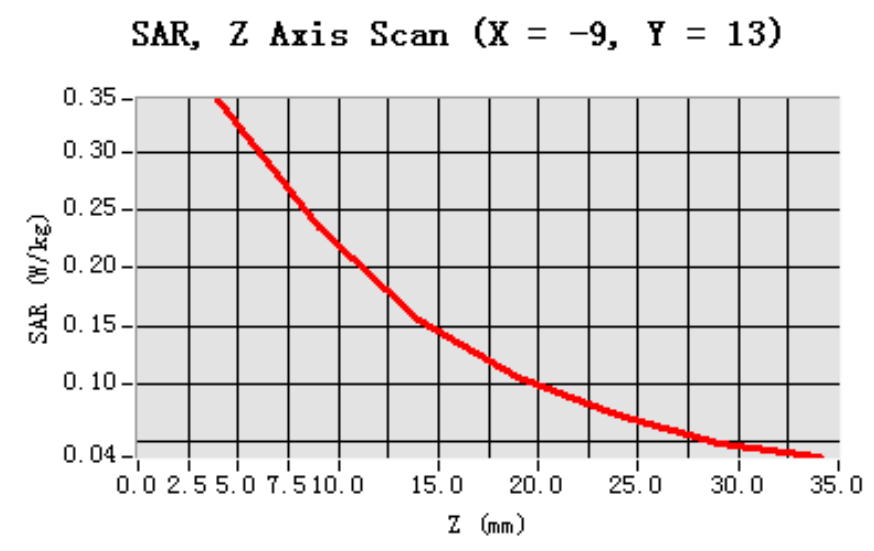
Frequency (MHz)	1850.400024
Relative permittivity (real part)	52.313000
Relative permittivity (imaginary part)	13.584900
Conductivity (S/m)	1.506522
Variation (%)	-0.130000



Maximum location: X=-9.00, Y=13.00

SAR 10g (W/Kg)	0.189437
SAR 1g (W/Kg)	0.268374

Z Axis Scan



MEASUREMENT 2

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 44 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

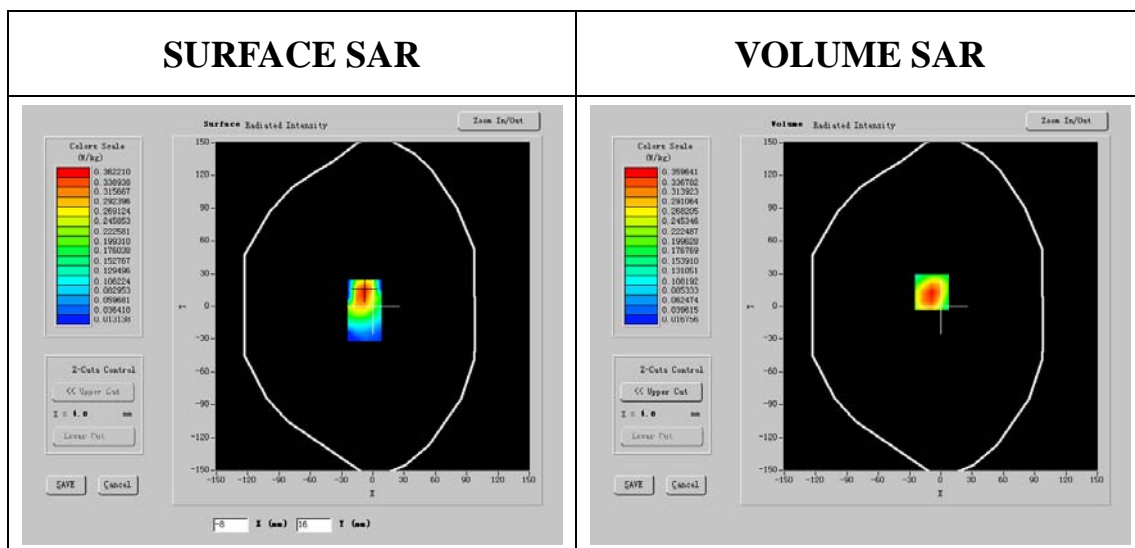
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	Middle
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

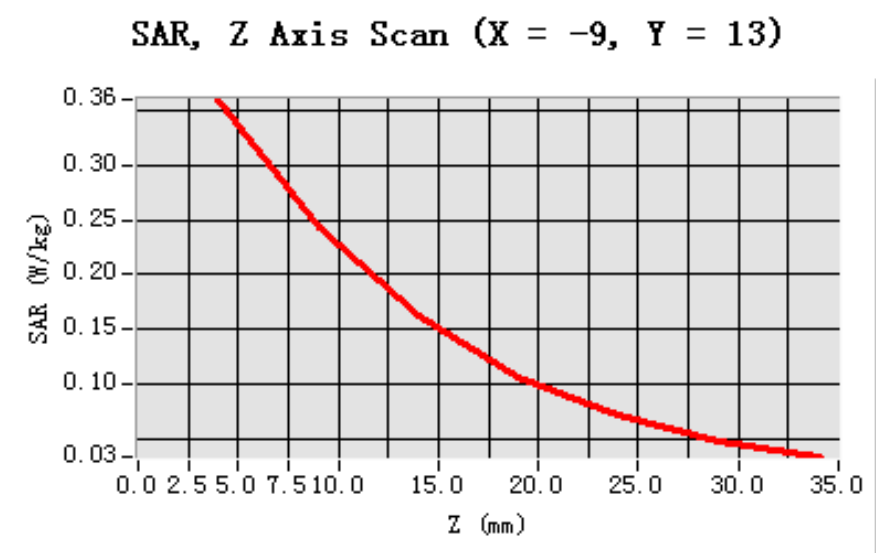
Frequency (MHz)	1880.000000
Relative permittivity (real part)	52.893001
Relative permittivity (imaginary part)	13.813800
Conductivity (S/m)	1.512775
Variation (%)	-0.800000



Maximum location: X=-9.00, Y=13.00

SAR 10g (W/Kg)	0.193673
SAR 1g (W/Kg)	0.285231

Z Axis Scan



MEASUREMENT 3

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 44 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

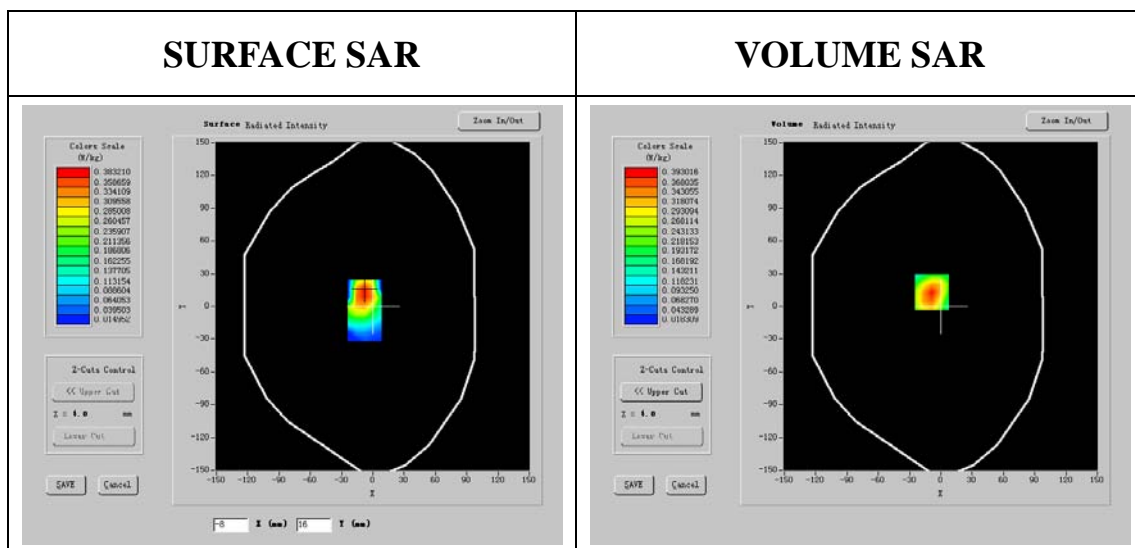
Phantom File	surf_sam_plan.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GSM1900
Channels	High
Signal	GSM

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthetizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

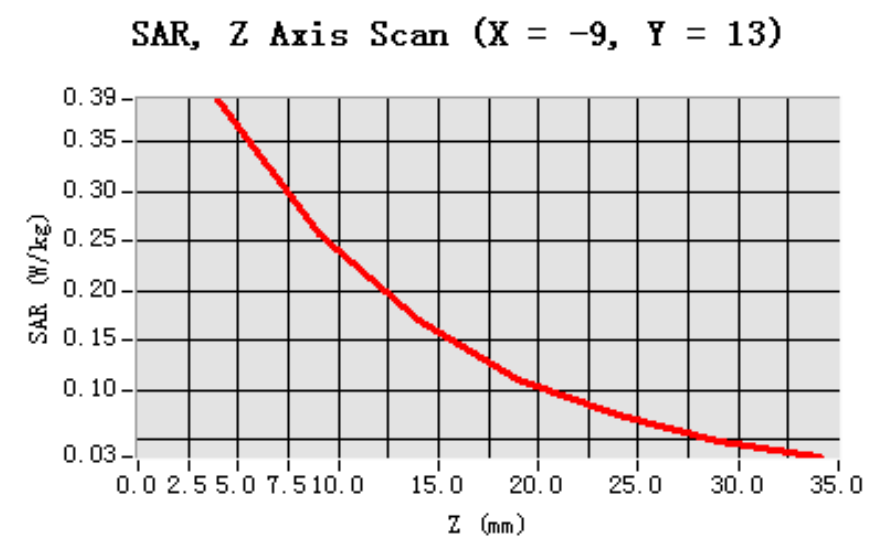
Frequency (MHz)	1909.599976
Relative permittivity (real part)	52.185279
Relative permittivity (imaginary part)	13.668900
Conductivity (S/m)	1.510225
Variation (%)	-0.600000



Maximum location: X=-9.00, Y=13.00

SAR 10g (W/Kg)	0.201123
SAR 1g (W/Kg)	0.302128

Z Axis Scan



GPRS 850

II. RESULTS

<u>TYPE</u>	<u>BAND</u>	<u>PARAMETERS</u>
<u>Noise</u>	--	--
<u>Validation</u>	--	--
<u>Phone</u>	<u>GPRS850</u>	<u>Measurement 1:</u> Validation Plane with Body device position on Low Channel in GPRS mode <u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in GPRS mode <u>Measurement 3:</u> Validation Plane with Body device position on High Channel in GPRS mode

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

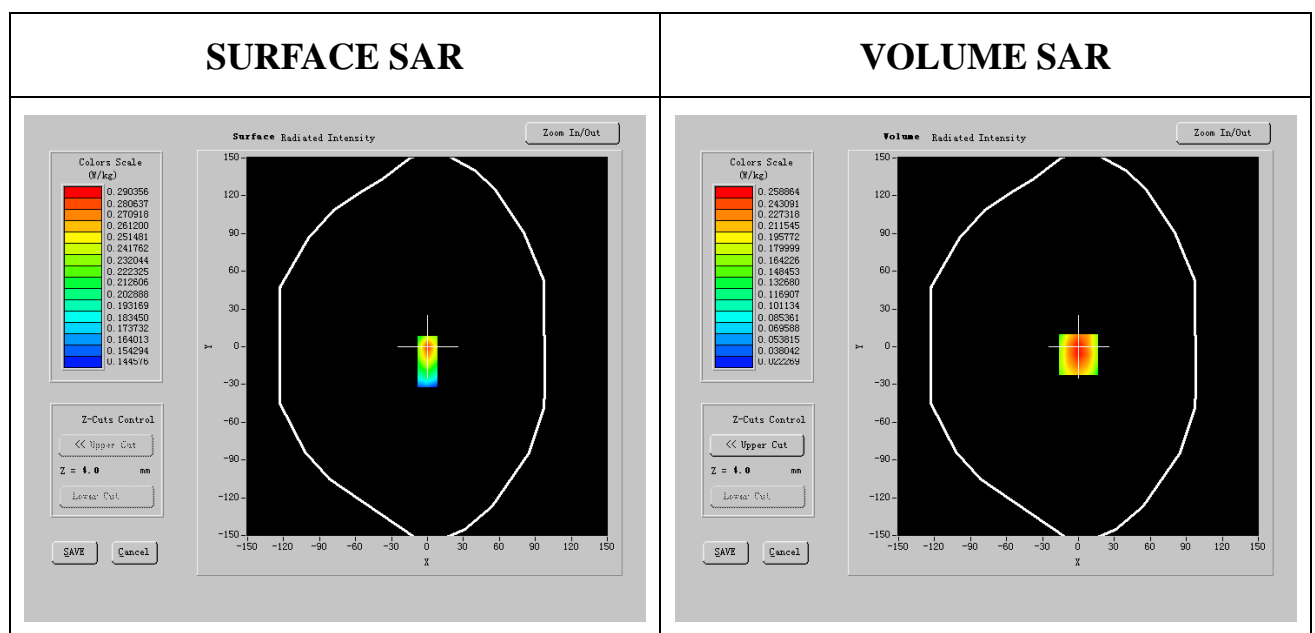
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS850
Channels	Low
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

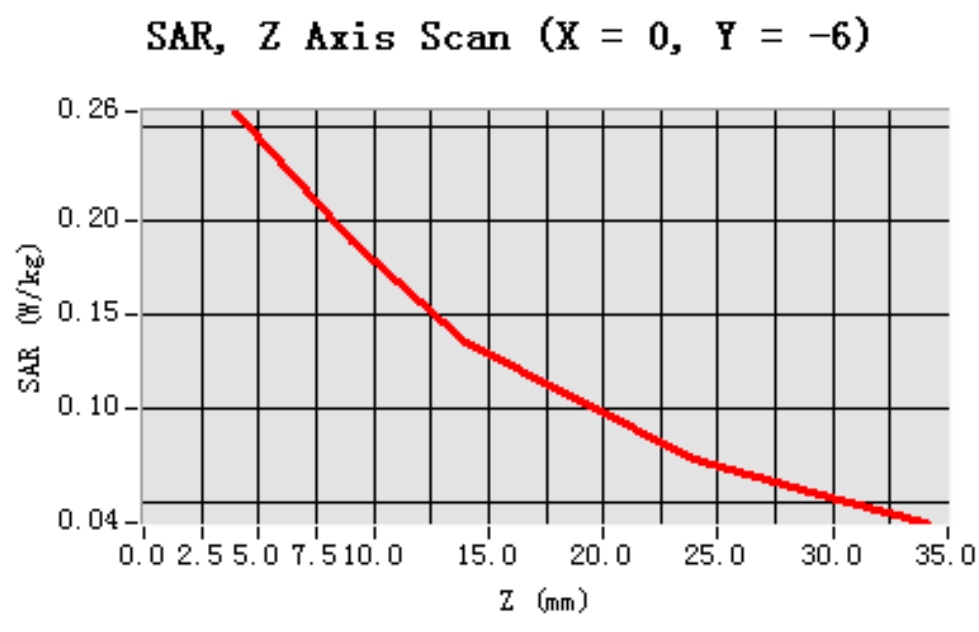
Frequency (MHz)	824.200012
Relative permittivity (real part)	54.584000
Relative permittivity (imaginary part)	21.654150
Conductivity (S/m)	0.961519
Variation (%)	-1.100000



Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.157544
SAR 1g (W/Kg)	0.256172

Z Axis Scan



MEASUREMENT 2

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

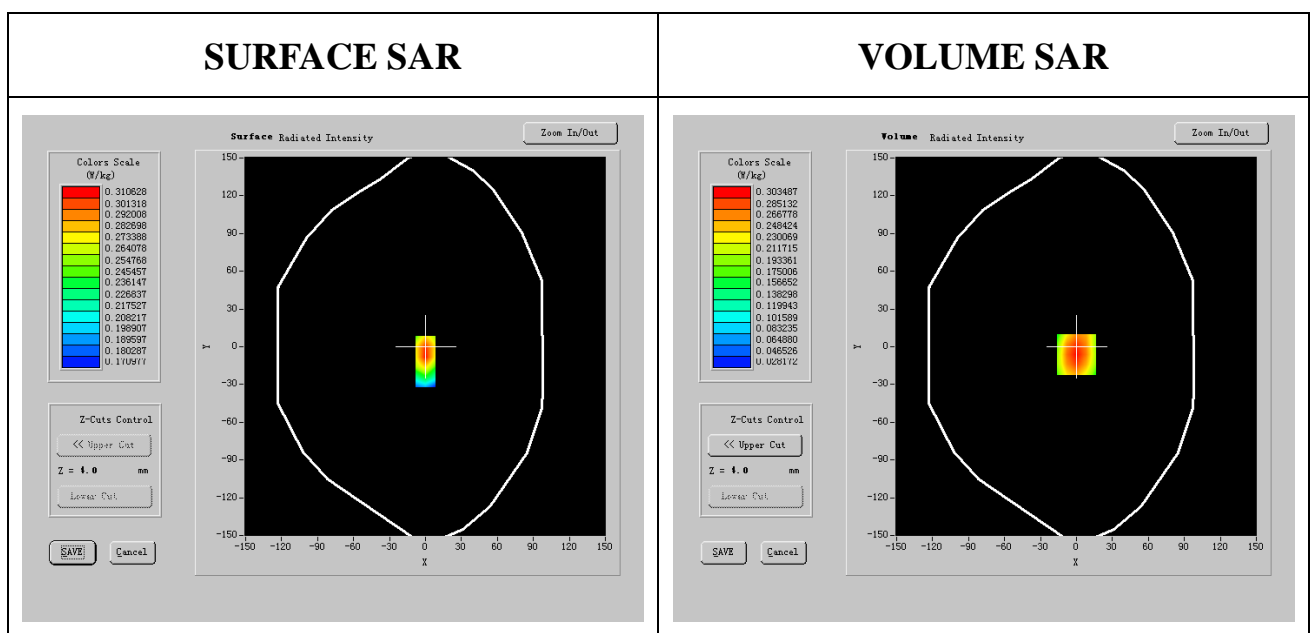
Phantom File	surf_sam_plan.txt, Adaptive 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS850
Channels	Middle
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

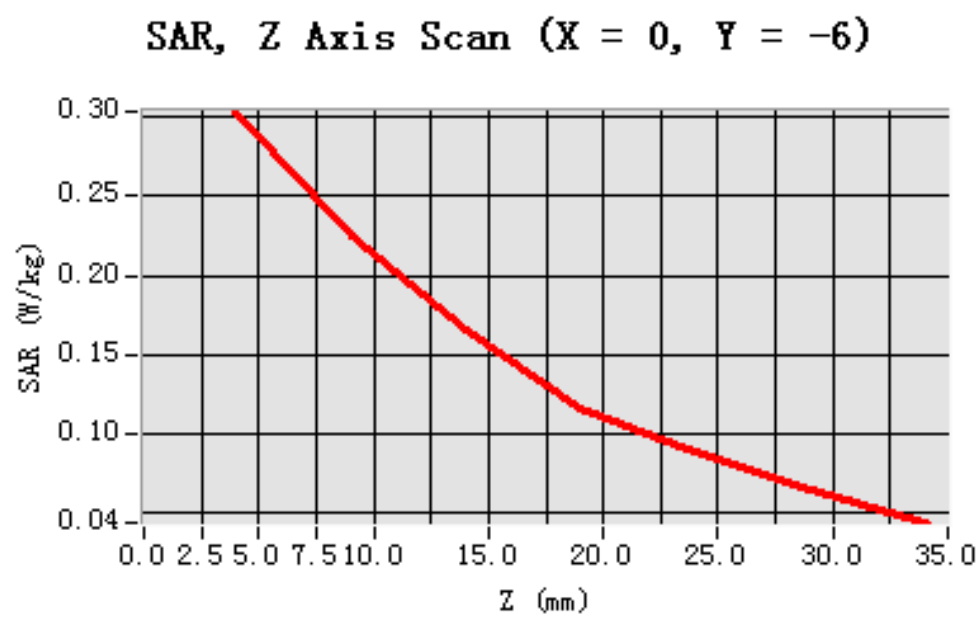
Frequency (MHz)	836.400024
Relative permittivity (real part)	54.501999
Relative permittivity (imaginary part)	21.866249
Conductivity (S/m)	0.962342
Variation (%)	-0.200000



Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.186821
SAR 1g (W/Kg)	0.275353

Z Axis Scan



MEASUREMENT 3

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 14 minutes 29 seconds

Mobile Phone IMEI number:

A. Experimental conditions.

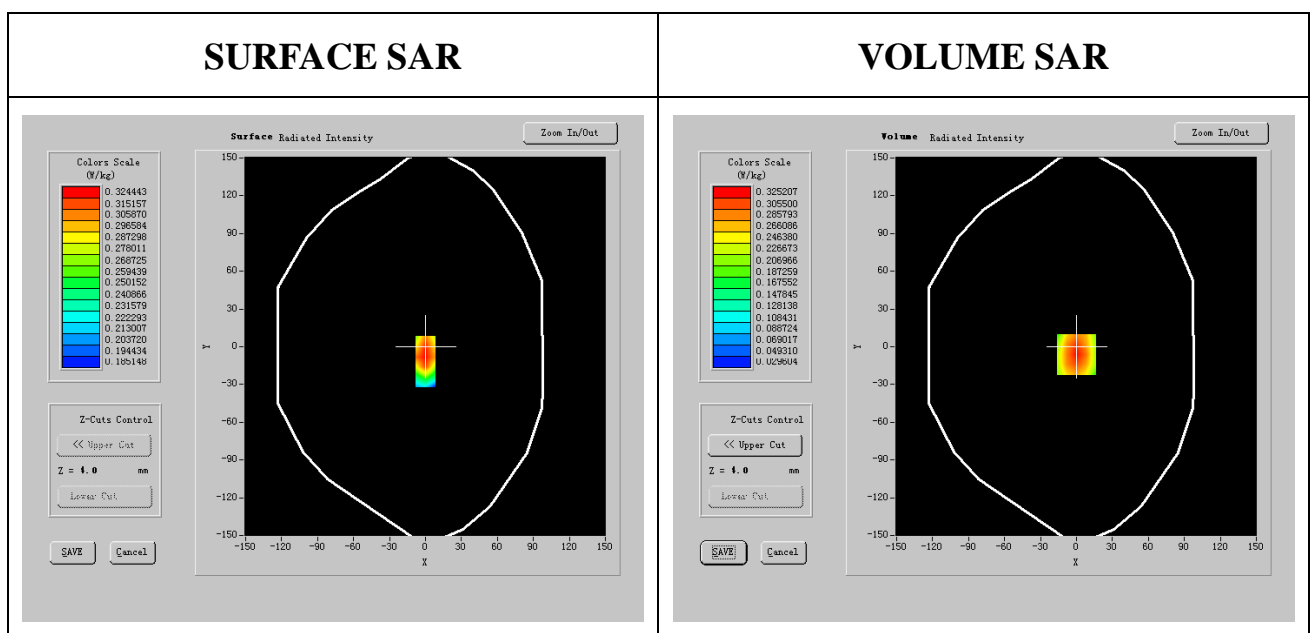
Phantom File	surf_sam_plan.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS850
Channels	High
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V 3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

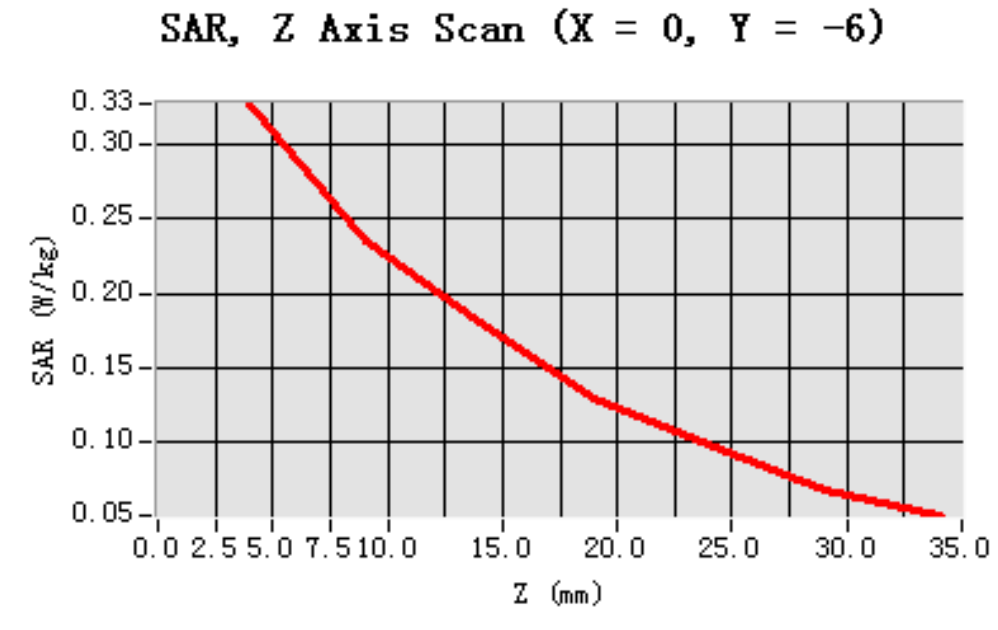
Frequency (MHz)	848.599976
Relative permittivity (real part)	54.576000
Relative permittivity (imaginary part)	21.726601
Conductivity (S/m)	0.964288
Variation (%)	-0.220000



Maximum location: X=0.00, Y=-6.00

SAR 10g (W/Kg)	0.198113
SAR 1g (W/Kg)	0.312345

Z Axis Scan



GPRS 1900

I. RESULTS

<u>TYPE</u>	<u>BAND</u>	<u>PARAMETERS</u>
<u>Noise</u>	--	--
<u>Validation</u>	--	--
<u>Phone</u>	<u>GPRS1900</u>	<u>Measurement 1:</u> Validation Plane with Body device position on Low Channel in GPRS mode <u>Measurement 2:</u> Validation Plane with Body device position on Middle Channel in GPRS mode <u>Measurement 3:</u> Validation Plane with Body device position on High Channel in GPRS mode

MEASUREMENT 1

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 6 minutes 46 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

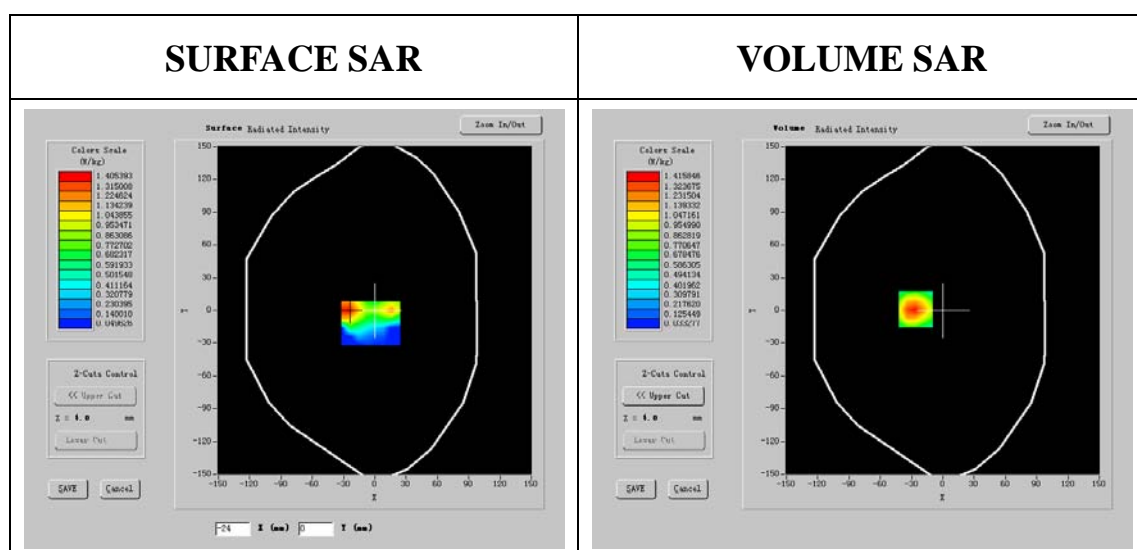
Phantom File	zinf15.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS1900
Channels	Low
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthetizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

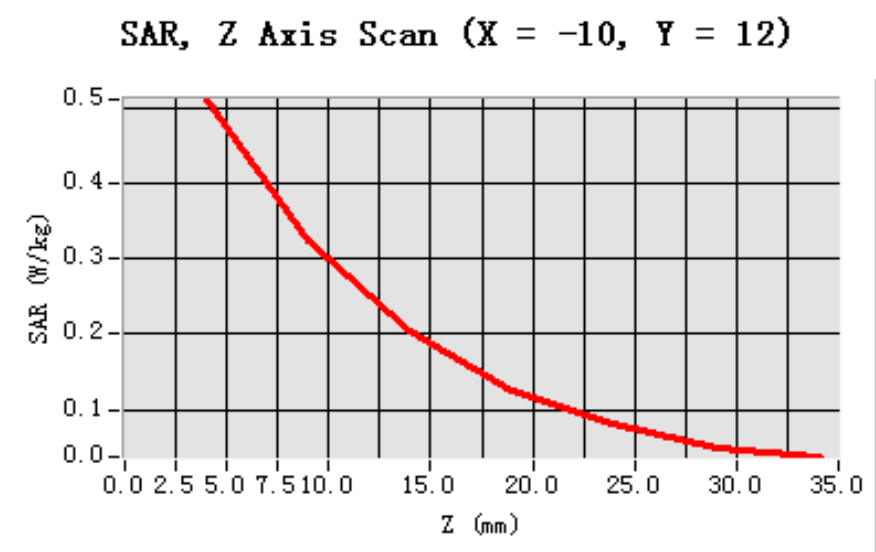
Frequency (MHz)	1710.199951
Relative permittivity (real part)	52.347400
Relative permittivity (imaginary part)	14.450693
Conductivity (S/m)	1.533698
Variation (%)	-0.440000



Maximum location: X=-31.00, Y=-16.00

SAR 10g (W/Kg)	0.208140
SAR 1g (W/Kg)	0.355326

Z Axis Scan



MEASUREMENT 2

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 6 minutes 51 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

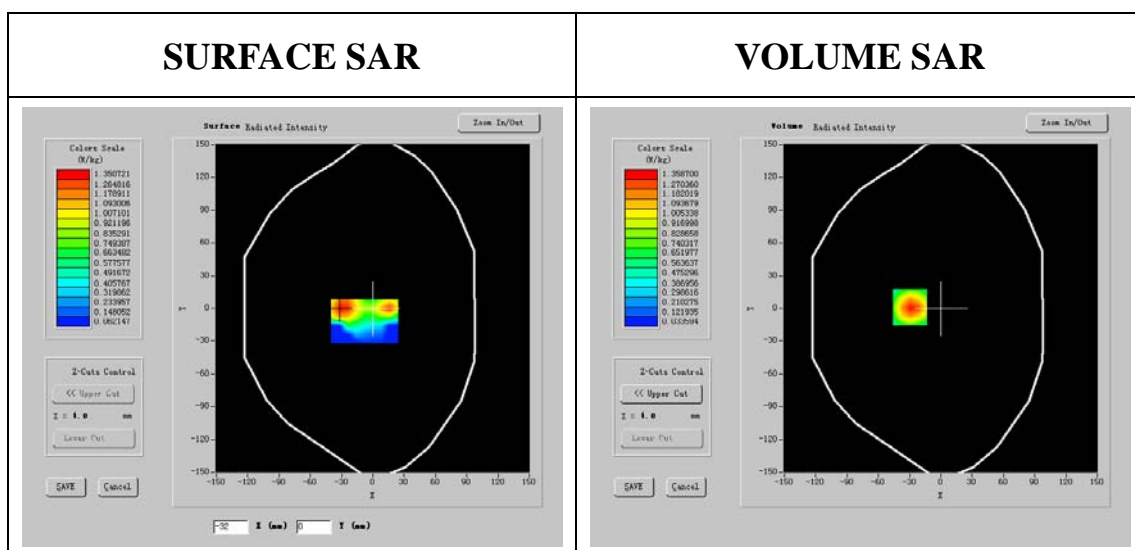
Phantom File	zinf15.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS1900
Channels	Middle
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

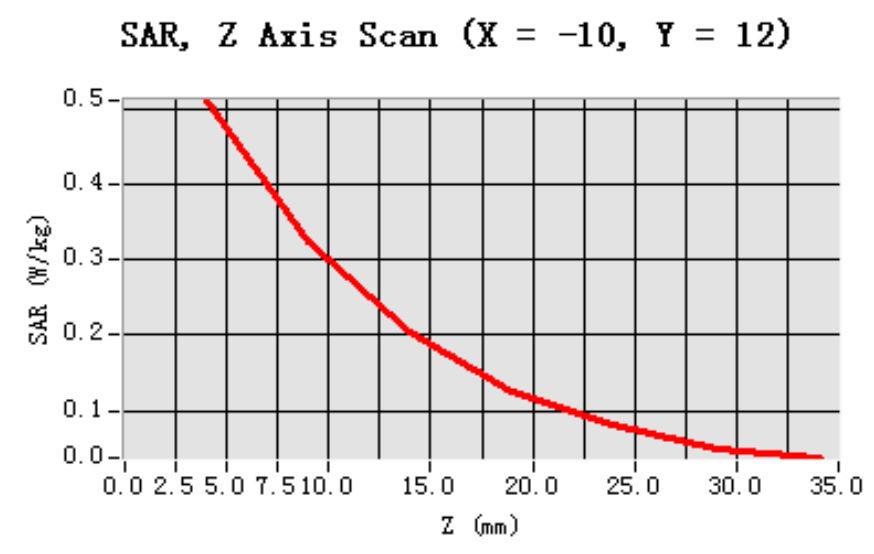
Frequency (MHz)	1747.400004
Relative permittivity (real part)	51.417028
Relative permittivity (imaginary part)	14.293556
Conductivity (S/m)	1.514286
Variation (%)	-1.000000



Maximum location: X=-31.00, Y=-16.00

SAR 10g (W/Kg)	0.209379
SAR 1g (W/Kg)	0.367457

Z Axis Scan



MEASUREMENT 3

Type: Phone measurement (Complete)

Date of measurement: 9/4/2010

Measurement duration: 6 minutes 21 seconds

Mobile Phone IMEI number: --

A. Experimental conditions.

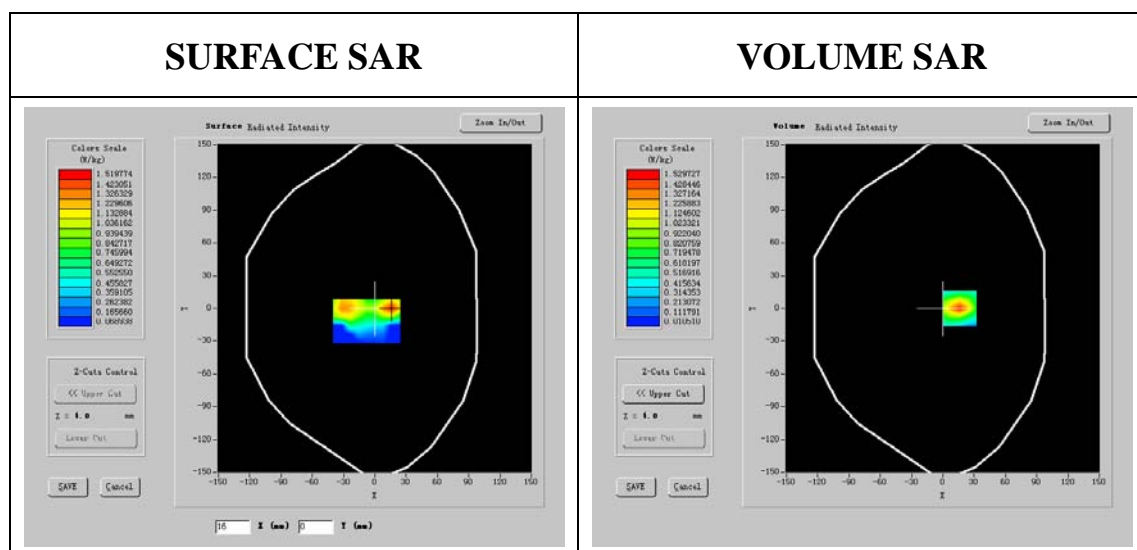
Phantom File	zinf15.txt, Adaptative 2 max
Phantom	Validation plane
Device Position	Body
Band	GPRS1900
Channels	High
Signal	GPRS

B. Instrumentations.

PC	HP (Pentium(R) V3.06GHz, SN:375052-AA1)
Network Emulator	R&S (CMU200, SN:B23-03291)
Voltmeter	Keithley (2000, SN:1015843)
Synthesizer	Agilent (E8257C, SN:MY43321570)
Amplifier	Mini-Circuits (ZHL-42, SN:110405)
Power Meter	Agilent (E4416A, SN:QB41292714)
Probe	Antennessa (SN:SN11/09 EP100)
Phantom	Antennessa (SN:SN41_05_SAM29)
Liquid	Antennessa

C. SAR Measurement Results

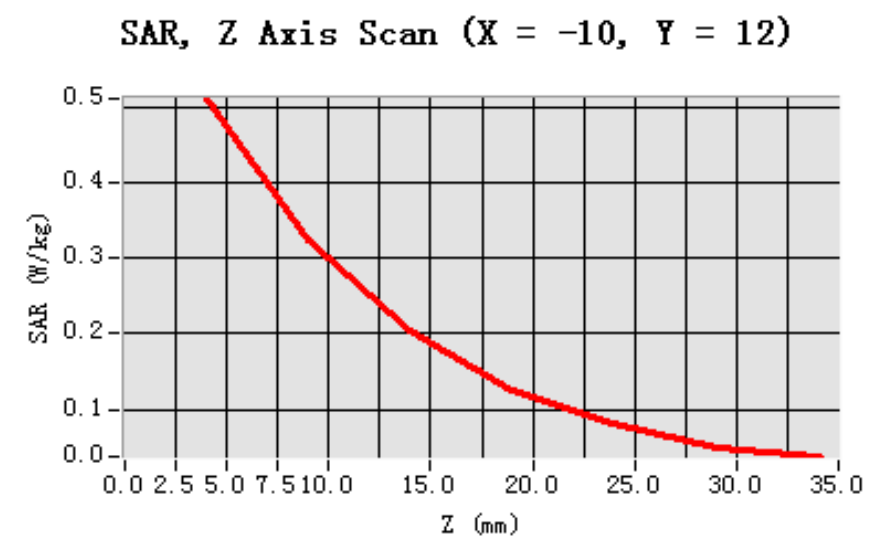
Frequency (MHz)	1784.599036
Relative permittivity (real part)	51.813332
Relative permittivity (imaginary part)	14.319230
Conductivity (S/m)	1.513224
Variation (%)	-0.100000



Maximum location: X=2.00, Y=9.00

SAR 10g (W/Kg)	0.213284
SAR 1g (W/Kg)	0.373282

Z Axis Scan



Submit 3 Dipole Calibration Report



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SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA

校准证书编号: 2008J10-10-812002
Calibrated certificate series No.

CALIBRATION CERTIFICATE

上海市计量测试技术研究院
华东国家计量测试中心

校准证书

委托者 Customer	程智科技股份(昆山)有限公司 Compliance Certification Services Inc.
委托者地址 Address of customer	江苏省昆山市(留学创业园)伟业路10号 No. 10, Wei-Ye Rd., Innovation park, Eco & Tec, Development Zone, Kun Shan City, Jiang Su, P. R. O. C.
器具名称 Name of instrument	偶极子天线 DIPOLE ANTENNA
制造厂 Manufacturer	ANTENNESSA 公司
型号/规格 Model/Specification	DIPOLE 900MHz
器具编号 No. of instrument	SN 48/05 DIPD33
器具准确度 Instrument accuracy	/

(机构校准专用章)

证书批准人 Approved by	
核 验 员 Checked by	刘 融
校 准 员 Calibrated by	高 晨

校准日期	2008	年	12	月	10	日
Date for calibrated		Year		Month		Day

地址: 上海市张衡路 1500 号(总部) Address No.1500 Zhangheng Road, Shanghai(headquarters)	电话: 021-38839800 Tel.	传真: 021-50798390 Fax.	邮编: 201203 Post Code	投诉电话: 021-50798262 Tel. for complaint
上海市宜山路 716 号(分部) No. 716 Yishan Road, Shanghai(branch)	电话: 021-64701390 Tel.	传真: 021-64701810 Fax.	邮编: 200233 Post Code	

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812002
Calibrated certificate series No.国家法定计量检定机构计量授权证书号(中心/院): (国)法计(2002)01039号/(2002)01019号
The number of the Certificate of Metrological Authorization to The Legal Metrological Verification Institution is No. (2002) 01039 / No. (2002) 01019中国合格评定国家认可委员会实验室认可证书号: No. CNAS L0134
The number of the certificate accredited by CNAS is No. L0134本次校准所依据的技术规范(代号、名称):
Reference documents for the calibration (code, name)

JCJ/J101002.1/0-2007 SAR偶极子天线校准规范

IEEE Std 1528-2003 "IEEE Recommended Practice for Determining the Peak
Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head
form Wireless Communications Devices: Measure Techniques"IEC 62209-1: 2005 Procedure to measure the Specific Absorption Rate (SAR) in the
frequency range of 300 MHz to 3 GHz Part 1: hand-held mobile wireless
communication devices本次校准所使用的主要计量标准器具:
Main measurement standards used in this calibration

名称/型号 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
VECTOR NETWORK ANALYZER ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz~8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz~500 kHz

以上计量标准器具的量值溯源至国家基准。

Quantity values of above measurement standards used in this calibration are traced to those of the national primary standards in the P.R. China.

校准地点及环境条件:
Location and environmental condition for the calibration地点: 宜山路 716 号 (No. 716 Yishan Road)
Location温度: 23 $^{\circ}$ C; 湿度: 49 %RH; 其它: /
Ambient temperature Relative humidity Others本次校准结果的扩展不确定度:
Expanded uncertainty+3dB 至 -15dB: $U=0.8$ dB ($k=2$)-15dB 至 -25dB: $U=1.2$ dB ($k=2$)-25dB 至 -35dB: $U=3.1$ dB ($k=2$)校准结果/说明:
Results of calibration and additional explanation

Pass

The requirements of the calibration criterion: return Loss must be less than -20dB

本证书提供的结果仅对本次被校的器具有效。
The data are valid only for the instrument(s).

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812002
Calibrated certificate series No.

校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

1. Calibration procedure:

Return Loss is measured with the dipole mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis. During calibration, the flat phantom is filled with the liquid whose parameters are calibrated relative to different frequency.

2. Calibration Conditions:

A. The spacer from Dipole center to TSL

Distance Dipole Center - TSL	Frequency
15mm±0.2mm with spacer	900MHz

B. Head TSL parameters

The following parameters and calculation were applied.

Head TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Head TSL Parameters (Permittivity/ Conductivity)	Measurement Head TSL parameters (Permittivity/ Conductivity)
900 MHz	41.50/0.97	41.71/1.00

C. Body TSL parameters

The following parameters and calculation were applied.

Body TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Body TSL Parameters (Permittivity/ Conductivity)	Measurement Body TSL parameters (Permittivity/ Conductivity)
900 MHz	55.00/1.05	54.62/1.04

3. Measurement Results

Frequency	Return Loss with Head TSL	Return Loss with Body TSL
900 MHz	-25.06 dB	-24.23 dB



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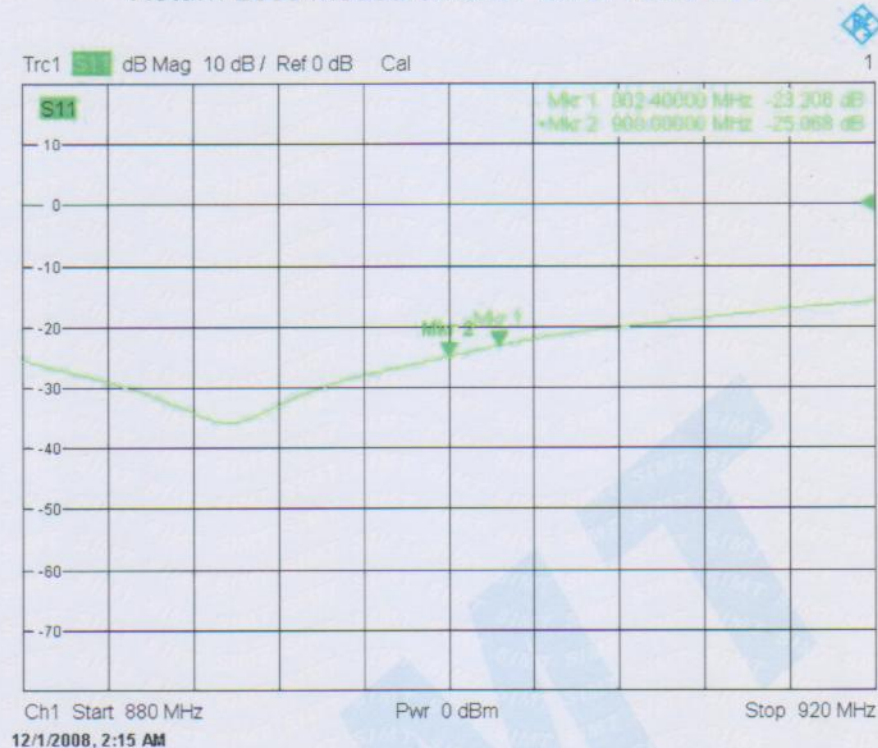
SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA

校准证书编号: 2008J10-10-812002
Calibrated certificate series No.

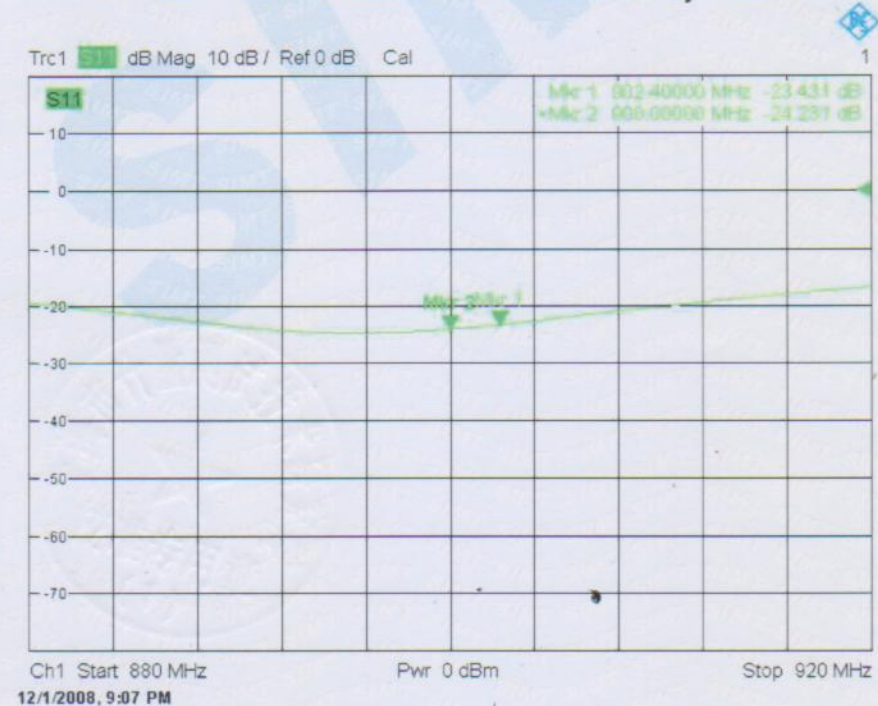
校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

Return Loss Measurement Plot for head TSL



Return Loss Measurement Plot for Body TSL



Remark: Attachment 1:SAR validation & Test equipment

End

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812002
Calibrated certificate series No.

Attachment 1: SAR validation & Test equipment

Validation	Condition	SAR Value (W/kg)	
		1g	10g
SAR measured with Head TSL	1W (input power)	11.11	7.27
SAR measured with Body TSL	1W (input power)	10.98	7.29

名称/型号 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
6 axis Robot KR3	容-027-01	/	6 axes, Repeatability: ± 0.05 mm, Nominal payload: 3 kg
Vector Network Analyzer ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz to 8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz to 500 kHz
Signal Generator SMT 06	容-027-15	2008F33-10-001469 2009.06.26	5 kHz - 6 GHz, Resolution: 0.1Hz, -144 to + 13 dBm, Max.RF power: 1W, Max.DC voltage: 0V / Level > -127 dBm: f<1.5 GHz: < 1dB; f>1.5 GHz: < 1.5dB; f> 3GHz: < 2dB
Power Meter NRVD	容-027-16	2008F31-10-001906 2009.06.24	100 kHz to 6 GHz, 10nW to 500mW
Millivoltmeter 2000	容-027-26	2008F11-10-001004 2009.06.19	Measurement range: 100.0000mV ~ 1000.000V Sensibility: 0.1 μ V ~ 1m V.
Power Amplifier BLMA 0820-6	容-027-18	2008F33-10-001467 2009.06.26	0.8 - 2 GHz; Output: 6W; Gain: min 37.8 / typ 40, ± 2 dB; Harmonics: 2nd: 20dBc, 3rd: 20dBc; Line power: 125 W.
Isotropic E-Field Probe E-FIELD PROBE	容-027-54	2008J10-10-801001 2008.12.25	Dipole resistance (in the connector plane): 1M Ω to 2M Ω Axial isotropy in human-equivalent liquids: < 0.25dB Hemispherical Isotropy in humanequivalent liquids < 0.5dB, Linearity < 0.5dB, Lower SAR detection threshold: 0.0015 Watts/kg
SAM Phantom	容-027-22	/	/

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NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812003
Calibrated certificate series No.

CALIBRATION CERTIFICATE

上海市计量测试技术研究院
华东国家计量测试中心

校准证书

委 托 者

Customer

程智科技股份(昆山)有限公司

Compliance Certification Services Inc.

委托者地址

Address of customer

江苏省昆山市(留学创业园)伟业路 10 号

No. 10, Wei-Ye Rd., Innovation park, Eco & Tec, Development Zone, Kun Shan City, Jiang Su, P. R. O. C.

器具名称

Name of instrument

偶极子天线

DIPOLE ANTENNA

制 造 厂

Manufacturer

ANTENNESSA 公司

型号/规格

Model/Specification

DIPOLE 1800MHz

器具编号

No. of instrument

SN 48/05 DIPF34

器具准确度

Instrument accuracy

/

证书批准人

Approved by

(机构校准专用章)

核 验 员

Checked by

校 准 员

Calibrated by

校准日期 2008 年 12 月 10 日
Date for calibrated Year Month Day地址: 上海市张衡路 1500 号(总部) 电话: 021-38839800
Address No.1500 Zhangheng Road, Shanghai(headquarters) Tel.上海市宜山路 716 号(分部) 电话: 021-64701390
No. 716 Yishan Road, Shanghai(branch) Tel.传真: 021-50798390
Fax.传真: 021-64701810
Fax.邮编: 201203
Post Code Tel. for complaint邮编: 200233
Post Code

投诉电话: 021-50798262

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812003
Calibrated certificate series No.国家法定计量检定机构计量授权证书号(中心/院): (国)法计(2002)01039号/(2002)01019号
The number of the Certificate of Metrological Authorization to The Legal Metrological Verification Institution is No. (2002) 01039 / No. (2002) 01019中国合格评定国家认可委员会实验室认可证书号: No. CNAS L0134
The number of the certificate accredited by CNAS is No. L0134

本次校准所依据的技术规范(代号、名称):

Reference documents for the calibration (code, name)

JCJ/J101002.1/0-2007 SAR偶极子天线校准规范

IEEE Std 1528-2003 "IEEE Recommended Practice for Determining the Peak

Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head
form Wireless Communications Devices: Measure Techniques"IEC 62209-1: 2005 Procedure to measure the Specific Absorption Rate (SAR) in the
frequency range of 300 MHz to 3 GHz Part 1: hand-held mobile wireless
communication devices

本次校准所使用的主要计量标准器具:

Main measurement standards used in this calibration

名称/型号 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
VECTOR NETWORK ANALYZER ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz~8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz~500 kHz

以上计量标准器具的量值溯源至国家基准。

Quantity values of above measurement standards used in this calibration are traced to those of the national primary standards in the P.R. China.

校准地点及环境条件:

Location and environmental condition for the calibration

地点: 宜山路 716 号 (No. 716 Yishan Road)

Location

温度: 23 $^{\circ}$ C; 湿度: 49 %RH; 其它: /

Ambient temperature

Relative humidity

Others

本次校准结果的扩展不确定度:

Expanded uncertainty

+3dB 至 -15dB: $U=0.8$ dB ($k=2$)-15dB 至 -25dB: $U=1.2$ dB ($k=2$)-25dB 至 -35dB: $U=3.1$ dB ($k=2$)

校准结果/说明:

Results of calibration and additional explanation

Pass

The requirements of the calibration criterion: return Loss must be less than -20dB

本证书提供的结果仅对本次被校的器具有效。

The data are valid only for the instrument(s).

校准证书续页专用

Continued page of calibration certificate

第 2 页 共 5 页
Page of total pages

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812003
Calibrated certificate series No.

校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

1. Calibration procedure:

Return Loss is measured with the dipole mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis. During calibration, the flat phantom is filled with the liquid whose parameters are calibrated relative to different frequency.

2. Calibration Conditions:

A. The spacer from Dipole center to TSL

Distance Dipole Center - TSL	Frequency
10mm±0.2mm with spacer	1800MHz

B. Head TSL parameters

The following parameters and calculation were applied.

Head TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Head TSL Parameters (Permittivity/ Conductivity)	Measurement Head TSL parameters (Permittivity/ Conductivity)
1800 MHz	40.00/1.40	39.40/1.37

C. Body TSL parameters

The following parameters and calculation were applied.

Body TSL temperature change is well controlled to be within $22\pm0.2^{\circ}\text{C}$ during test.

Frequency	Nominal Body TSL Parameters (Permittivity/ Conductivity)	Measurement Body TSL parameters (Permittivity/ Conductivity)
1800 MHz	53.30/1.52	51.86/1.52

3. Measurement Results

Frequency	Return Loss with Head TSL	Return Loss with Body TSL
1800 MHz	-20.82 dB	-22.01 dB



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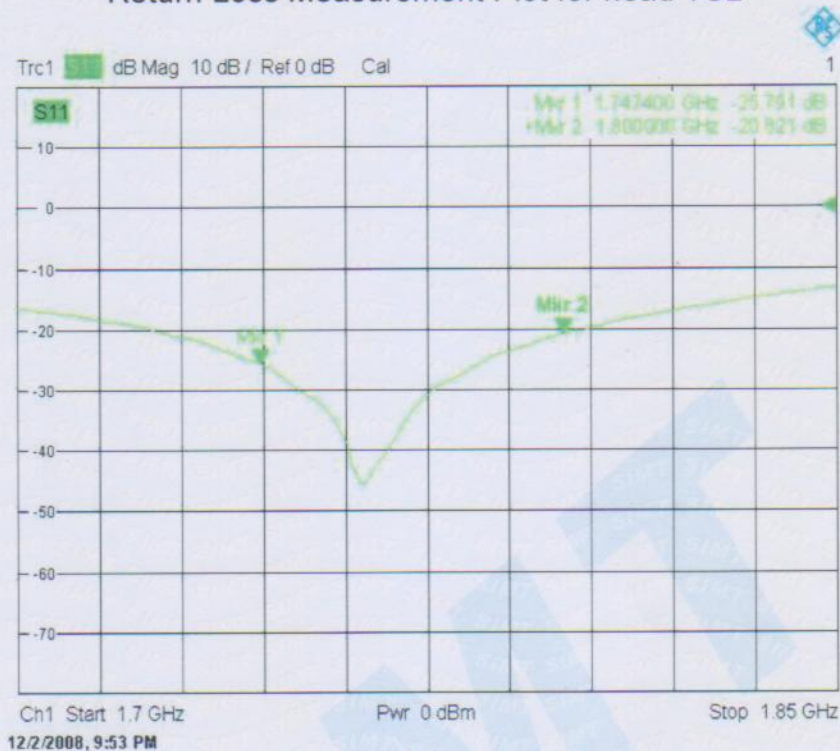
SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA

校准证书编号: 2008J10-10-812003
Calibrated certificate series No.

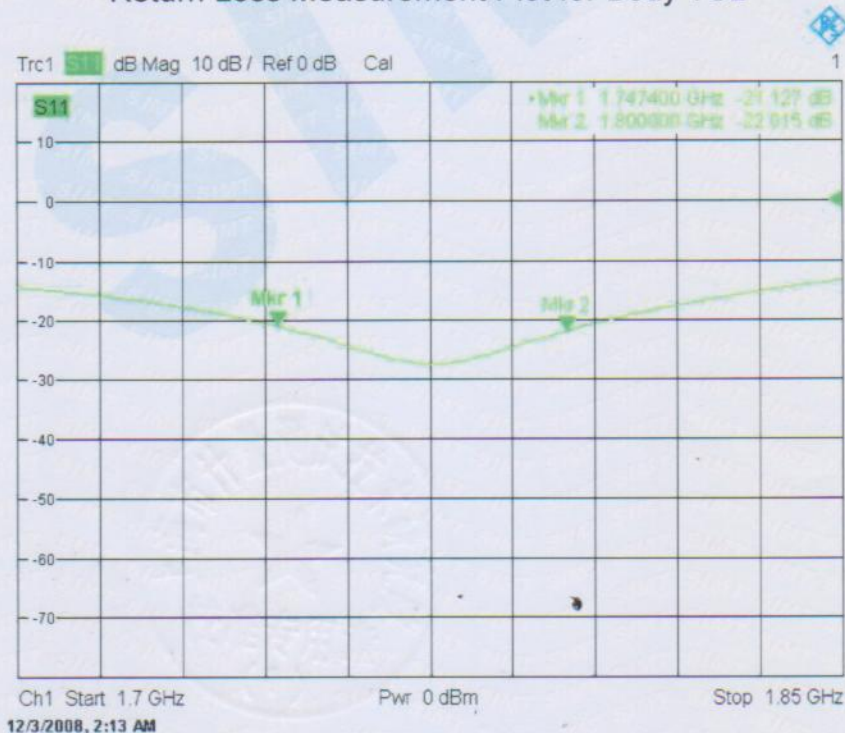
校准结果/说明 (续页):

Results of calibration and additional explanation (continued page)

Return Loss Measurement Plot for head TSL



Return Loss Measurement Plot for Body TSL



Remark: Attachment 1:SAR validation & Test equipment

End

**SIMT**SHANGHAI INSTITUTE OF MEASUREMENT AND TESTING TECHNOLOGY
NATIONAL CENTER OF MEASUREMENT AND TEST FOR EAST CHINA校准证书编号: 2008J10-10-812003
Calibrated certificate series No.

Attachment 1: SAR validation & Test equipment

Validation	Condition	SAR Value (W/kg)	
		1g	10g
SAR measured with Head TSL	1W (input power)	38.49	20.39
SAR measured with Body TSL	1W (input power)	37.78	20.06

名称/型号 Name/Model	编号 Number	证书编号/有效期限 Certificate No./Due date	测量范围/准确度 Measuring range/accuracy
6 axis Robot KR3	容-027-01	/	6 axes, Repeatability: ± 0.05 mm, Nominal payload: 3 kg
Vector Network Analyzer ZVB 8	容-027-27	2008F31-10-001907 2009.06.26	300 kHz to 8 GHz, Frequency resolution: 100 μ Hz, Measurement time: < 8 ms, Measurement bandwidths: 1 Hz to 500 kHz
Signal Generator SMT 06	容-027-15	2008F33-10-001469 2009.06.26	5 kHz - 6 GHz, Resolution: 0.1Hz, -144 to + 13 dBm, Max. RF power: 1W, Max. DC voltage: 0V / Level > -127 dBm: f<1.5 GHz: < 1dB; f>1.5 GHz: < 1.5dB; f> 3GHz: < 2dB
Power Meter NRVD	容-027-16	2008F31-10-001906 2009.06.24	100 kHz to 6 GHz, 10nW to 500mW
Millivoltmeter 2000	容-027-26	2008F11-10-001004 2009.06.19	Measurement range: 100.0000mV ~ 1000.000V Sensibility: 0.1 μ V ~ 1m V.
Power Amplifier BLMA 0820-6	容-027-18	2008F33-10-001467 2009.06.26	0.8 - 2 GHz; Output: 6W; Gain: min 37.8 / typ 40, ± 2 dB; Harmonics: 2nd: 20dBc, 3rd: 20dBc; Line power: 125 W.
Isotropic E-Field Probe E-FIELD PROBE	容-027-54	2008J10-10-801001 2008.12.25	Dipole resistance (in the connector plane): 1M to 2M Axial isotropy in human-equivalent liquids: <0.25dB Hemispherical Isotropy in humanequivalent liquids <0.5dB, Linearity <0.5dB, Lower SAR detection threshold: 0.0015 Watts/kg
SAM Phantom	容-027-22	/	/

Submit 4 E-field Calibration Report

COMOSAR E-Field probe Calibration Report



Ref: CR-131-1-09-SATB-A

Page: 1/17

Issue: A

Date: 2009/05/11

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Prepared By: BUTET Romain, SATIMO
Project Description: COMOSAR E-FIELD PROBE
Prepared For (End User): CCS

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COMOSAR E-Field probe Calibration Report



Ref: CR-131-1-09-SATB-A

Page: 2/17

Issue: A

Date: 2009/05/11

COMOSAR SEPT ISOTROPIC E-FIELD PROBE CALIBRATION REPORT

DATE: 6/8/2009

OFFER REFERENCE: PF.127.1.09.SATB.A

OBJECT: COMOSAR SEPT ISOTROPIC E-FIELD PROBE

MANUFACTURER: SATIMO

SERIAL NUMBER: SN 11/09 EP100

CUSTOMER: CCS

CONTRACT: B01351

DATE OF CALIBRATION: 16/04/2009

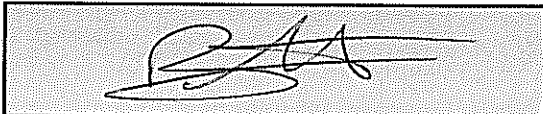
WARRANTY:

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Date

11/05/2009

SAR TEAM MANAGER

A rectangular box containing a handwritten signature in black ink. The signature is stylized, with a large, looped initial 'B' followed by several horizontal strokes.

COMOSAR E-Field probe Calibration Report



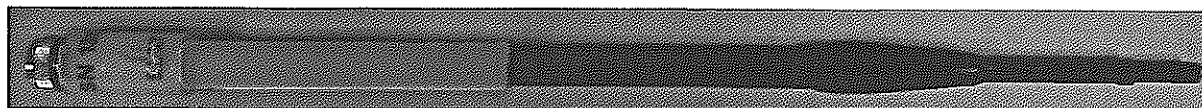
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PRODUCT DESCRIPTION



Frequency Range	100 MHz - 30 GHz
Probe length	330 mm
Length of one dipole	4.5 mm
Maximum external diameter	8 mm
Probe extremity diameter	6.5 mm
Distance between dipoles/probe extremity	< 2.7 mm
Resistance of the three dipole (at the connector)	Dipole 1: R1=2.5307 MΩ Dipole 2: R2=2.6353 MΩ Dipole 3: R3=2.5471 MΩ
Connector (HIROSE series SR30)	6 wire male (Hirose SR30series)

The probe could be checked by measuring the resistance of the three dipoles.

CALIBRATION TEST EQUIPMENT

TYPE	IDENTIFICATION	DATE OF CALIBRATION
Calibration bench	CALISAR CALIBRATION SYSTEM V2.0	
Multimeter	Keithley (2000, SN: 1000572)	Date of calibration: 01-07-2008

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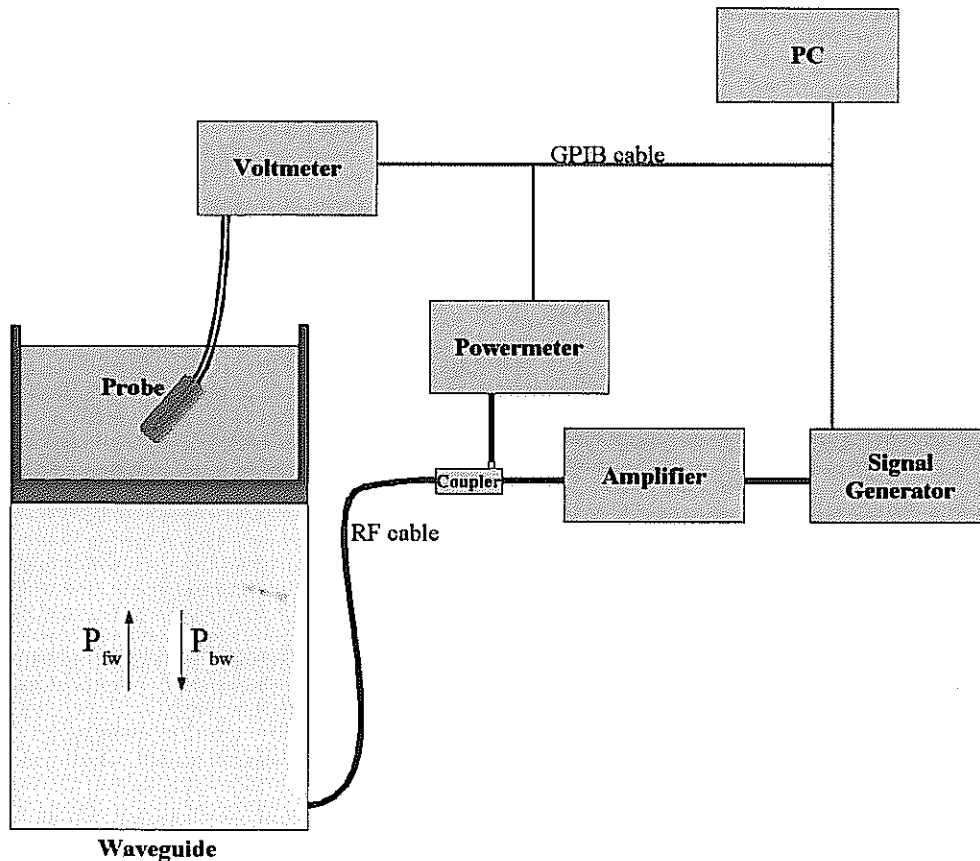
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MEASUREMENT PROCEDURE

Probe calibration is realized, in compliance with CENELEC EN 50361 and IEEE 1528 std, with CALISAR, SATIMO proprietary calibration system. The calibration is performed with the EN 50361 annexe technique using reference guide at the five frequencies.



$$SAR = \frac{4(P_{fw} - P_{bw})}{ab\delta} \cos^2\left(\pi \frac{y}{a}\right) e^{-(2z/\delta)}$$

Where :

- P_{fw} = Forward Power
- P_{bw} = Backward Power
- a and b = Waveguide dimensions
- d = Skin depth

Keithley configuration:

Rate = Medium; Filter =ON; RDGS=10; FILTER TYPE =MOVING AVERAGE; RANGE AUTO

After each calibration, a SAR measurement is performed on a validation dipole and compared with a NPL calibrated probe, to verify it.

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PROBE UNCERTAINTIES

Calibration report of dosimetric SATIMO probe

Uncertainty on calibration system

ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	ci	Standard Uncertainty (%)
Incident or forward power	3,00%	Rectangular	$\sqrt{3}$	1	1,732%
Reflected power	3,00%	Rectangular	$\sqrt{3}$	1	1,732%
Liquid conductivity	5,00%	Rectangular	$\sqrt{3}$	1	2,887%
Liquid permittivity	4,00%	Rectangular	$\sqrt{3}$	1	2,309%
Field homogeneity	3,00%	Rectangular	$\sqrt{3}$	1	1,732%
Field probe positioning	5,00%	Rectangular	$\sqrt{3}$	1	2,887%
Field probe linearity	3,00%	Rectangular	$\sqrt{3}$	1	1,732%
Combined standard uncertainty					4,761%
Expanded uncertainty (confidence interval of 95%)					9,331%

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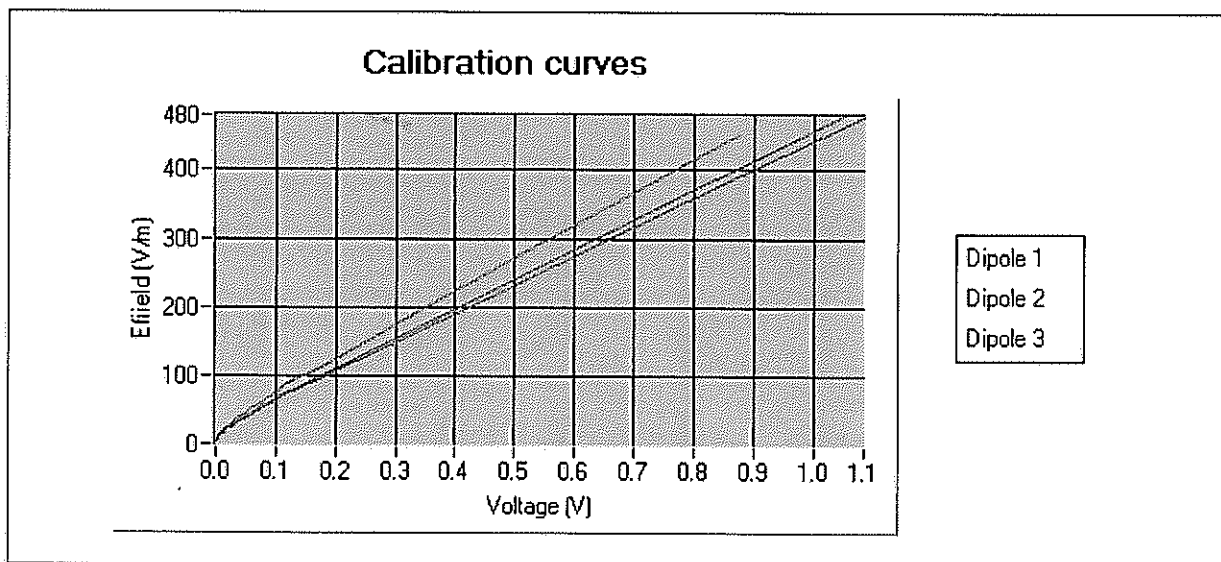
1. Calibration at 835.00 MHz

A. Calibration parameters.

Label	850
Epsilon	41.82
Sigma	0.89 S/m
Temperature	21°C
Cable loss	0.11 dB
Coupler loss	20.50 dB
Waveguide S11	-11.20 dB
Low limit detection	0.824 V/m (0.604 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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Calibration coefficients for the three dipoles in CW:

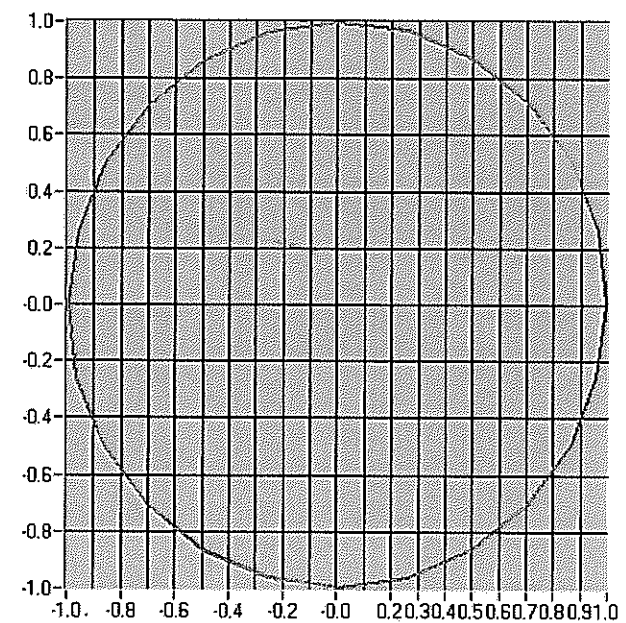
Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	41.82	0.89	20.63	20.50	28.35
Body	55.09	0.94	20.01	19.89	27.76

B. Isotropy.

- Axial isotropy: 0.029 dB
- Hemispherical isotropy: 0.030 dB

Isotropy curves



Hemispheric -30°
Hemispheric -15°
Hemispheric 0°
Hemispheric 15°
Hemispheric 30°

C. Linearity.

- Linearity:

0.04 dB

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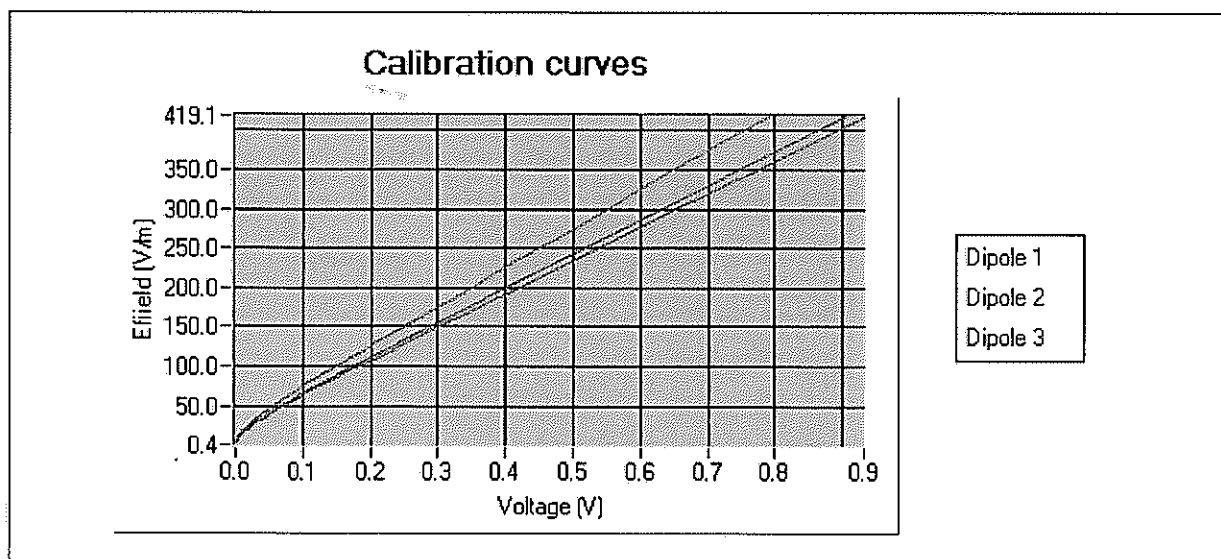
2. Calibration at 897.00 MHz

A. Calibration parameters.

Label	900
Epsilon	41.24
Sigma	0.94 S/m
Temperature	21°C
Cable loss	0.10 dB
Coupler loss	20.27 dB
Waveguide S11	-16.70 dB
Low limit detection	0.795 V/m (0.59 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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Calibration coefficients for the three dipoles in CW:

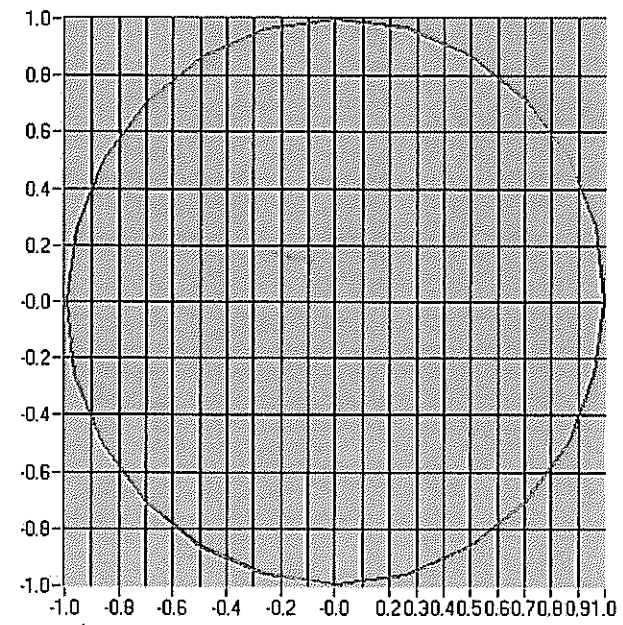
Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	41.24	0.94	22.07	22.01	30.17
Body	55.99	1.02	21.56	21.33	29.11

B. Isotropy.

- Axial isotropy: 0.029 dB
- Hemispherical isotropy: 0.030 dB

Isotropy curves



Hemispheric -30°
Hemispheric -15°
Hemispheric 0°
Hemispheric 15°
Hemispheric 30°

C. Linearity.

- Linearity:

0.04 dB

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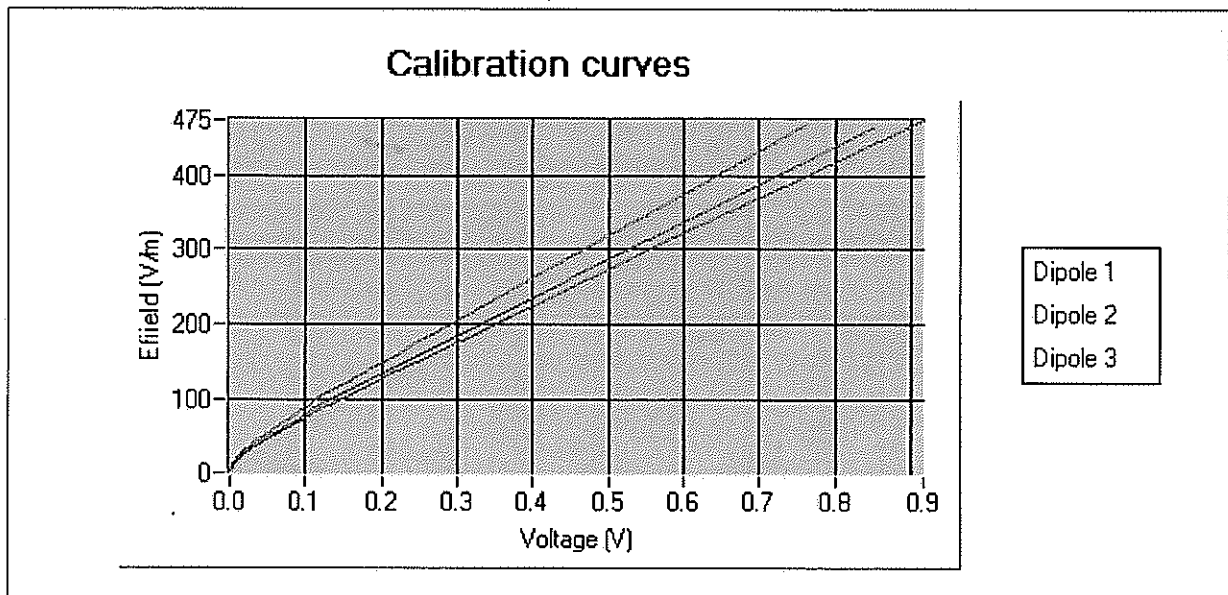
3. Calibration at 1747.00 MHz

A. Calibration parameters.

Label	1800
Epsilon	38.57
Sigma	1.34 S/m
Temperature	21°C
Cable loss	0.18 dB
Coupler loss	20.20 dB
Waveguide S11	-13.15 dB
Low limit detection	0.832 V/m (0.93 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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Calibration coefficients for the three dipoles in CW:

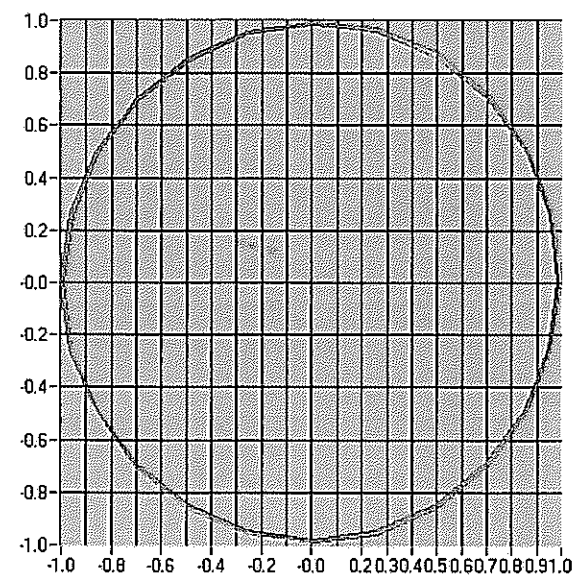
Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	38.57	1.34	37.12	38.57	50.40
Body	51.99	1.49	36.65	37.99	49.65

B. Isotropy.

- Axial isotropy: 0.050 dB
- Hemispherical isotropy: 0.076 dB

Isotropy curves



Hemispheric -30°
Hemispheric -15°
Hemispheric 0°
Hemispheric 15°
Hemispheric 30°

C. Linearity.

- Linearity:

0.03 dB

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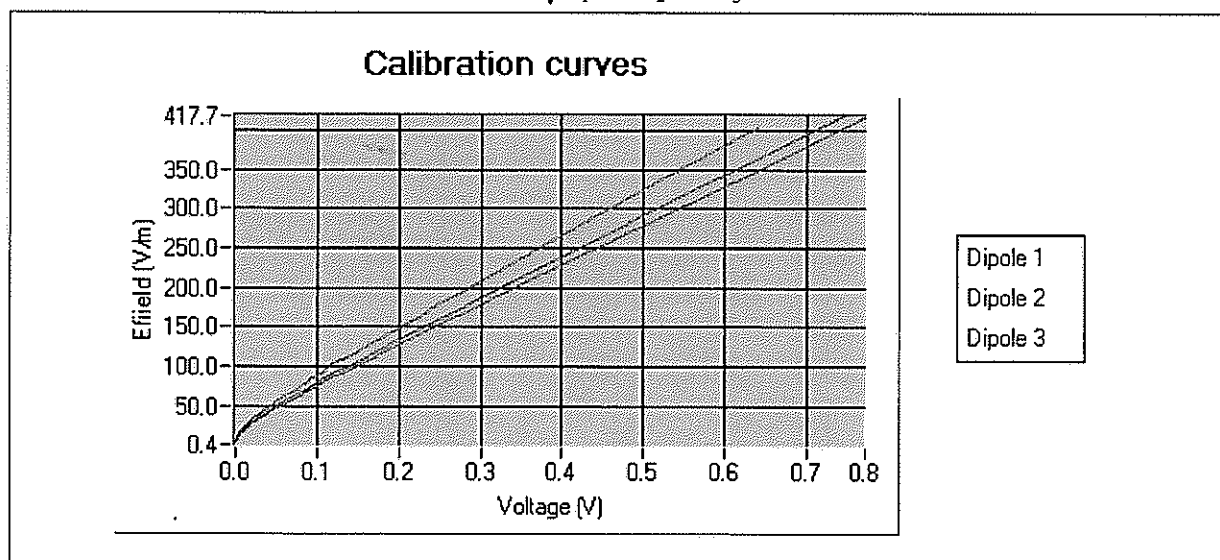
4. Calibration at 1880.00 MHz

A. Calibration parameters.

Label	1900
Epsilon	38.34
Sigma	1.45 S/m
Temperature	21°C
Cable loss	0.18 dB
Coupler loss	21.15 dB
Waveguide S11	-26.90 dB
Low limit detection	0.796 V/m (0.92 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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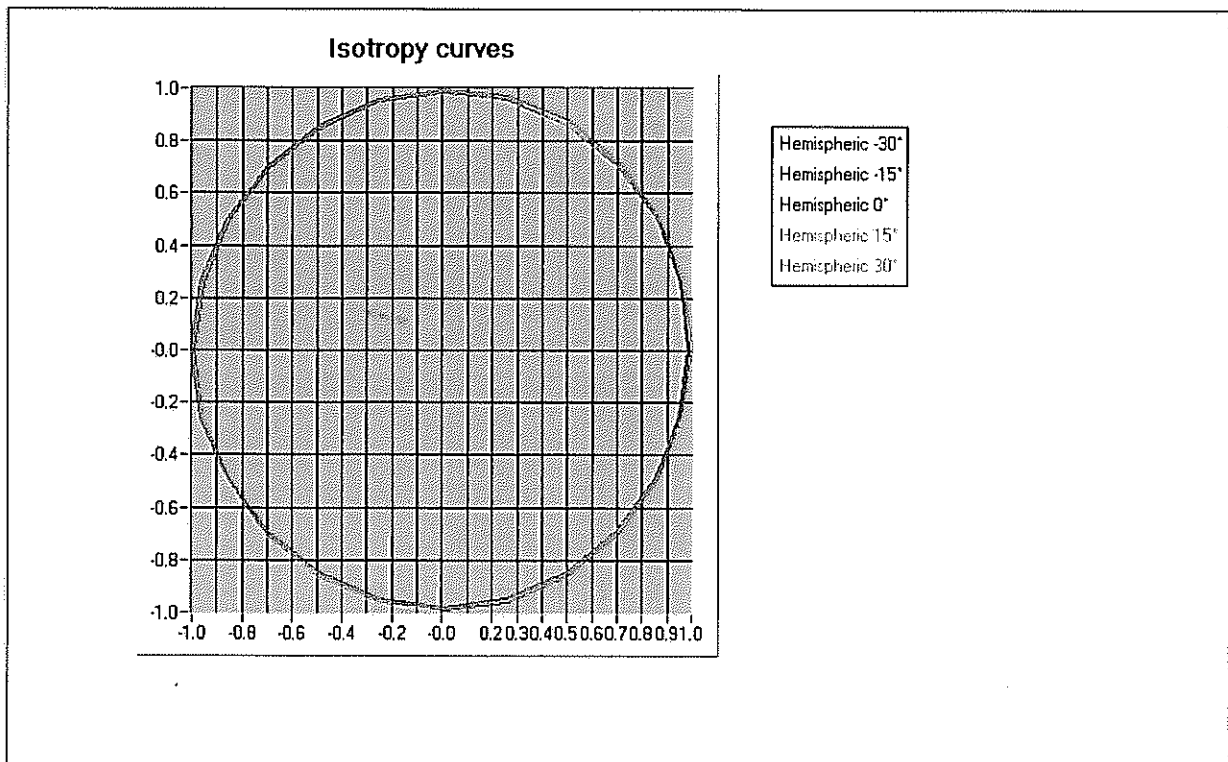
Calibration coefficients for the three dipoles in CW:

Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	38.34	1.45	41.07	42.36	55.46
Body	52.13	1.50	40.41	41.11	54.77

B. Isotropy.

- Axial isotropy: 0.050 dB
- Hemispherical isotropy: 0.076 dB



C. Linearity.

- Linearity: 0.03 dB

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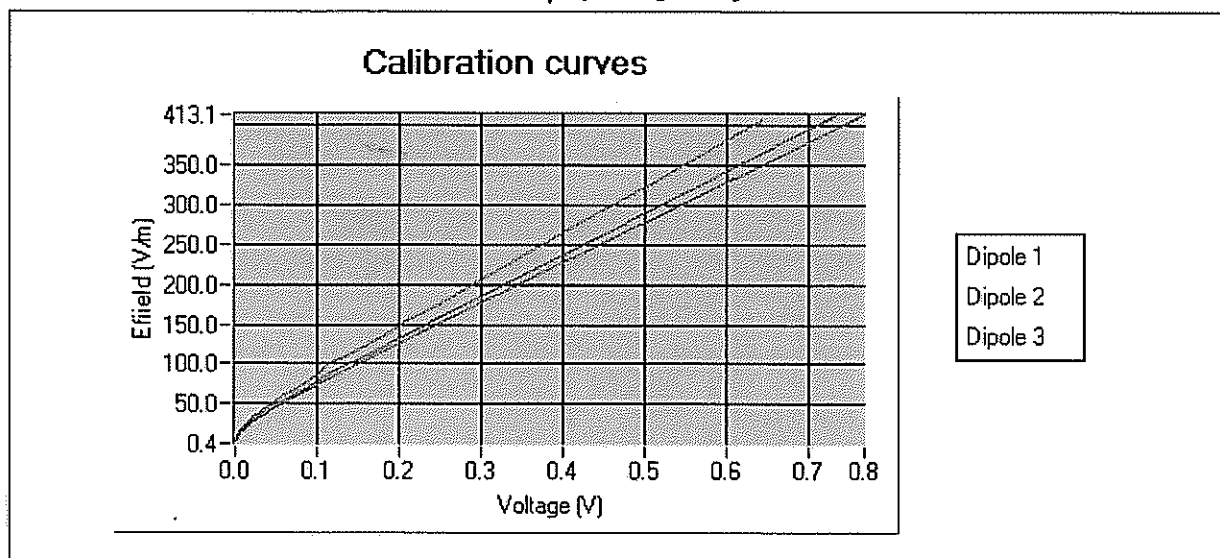
5. Calibration at 1950.00 MHz

A. Calibration parameters.

Label	2000
Epsilon	38.19
Sigma	1.47 S/m
Temperature	21°C
Cable loss	0.19 dB
Coupler loss	20.10 dB
Waveguide S11	-30.10 dB
Low limit detection	0.787 V/m (0.94 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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Calibration coefficients for the three dipoles in CW:

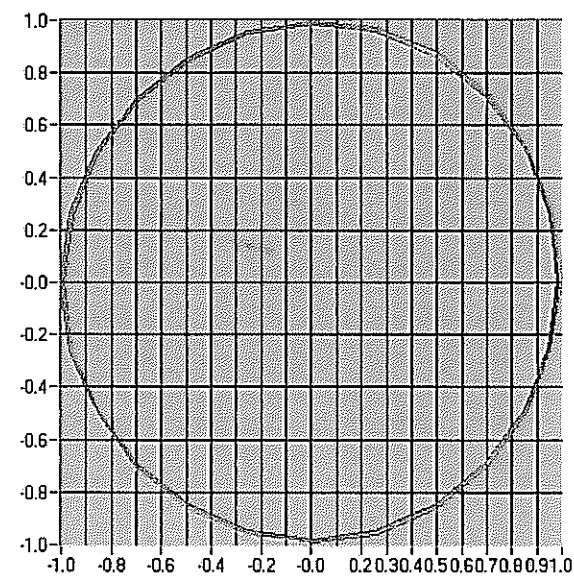
Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	38.19	1.46	41.92	43.16	56.44
Body	54.05	1.52	41.01	42.41	55.66

B. Isotropy.

- Axial isotropy: 0.050 dB
- Hemispherical isotropy: 0.076 dB

Isotropy curves



Hemispheric -30°
Hemispheric -15°
Hemispheric 0°
Hemispheric 15°
Hemispheric 30°

C. Linearity.

- Linearity:

0.03 dB

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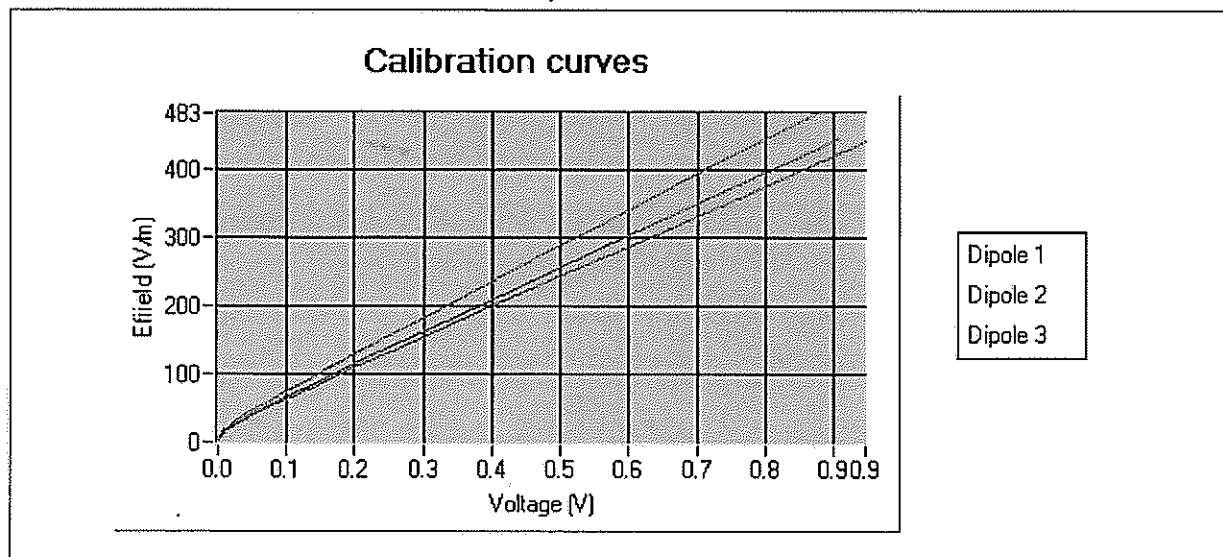
6. Calibration at 2450.00 MHz

A. Calibration parameters.

Label	2450
Epsilon	37.44
Sigma	1.75 S/m
Temperature	21°C
Cable loss	0.20 dB
Coupler loss	21.50 dB
Waveguide S11	-13.65 dB
Low limit detection	0.793 V/m (1.09 mW/kg)

Calibration curves $e_i=f(V)$ ($i=1,2,3$) allow to obtain E-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$



The following tables represent the calibration curves linearization by curve segment in CW signal.

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Calibration coefficients for the three dipoles in CW:

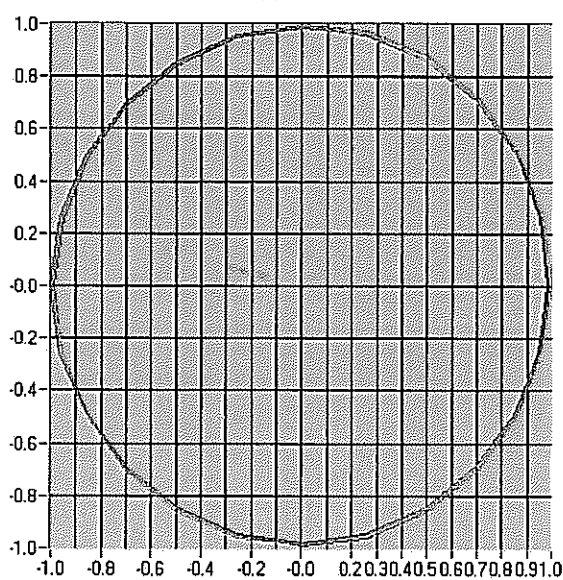
Sensitivity in liquid:

Liquid	Epsilon	Sigma (S/m)	CF dipole 1 (W.kg-1 (mV)-1)	CF dipole 2 (W.kg-1 (mV)-1)	CF dipole 3 (W.kg-1 (mV)-1)
Head	37.44	1.75	51.19	53.87	70.49
Body	53.70	1.96	50.36	52.99	69.77

B. Isotropy.

- Axial isotropy: 0.050 dB
- Hemispherical isotropy: 0.076 dB

Isotropy curves



Hemispheric -30°
Hemispheric -15°
Hemispheric 0°
Hemispheric 15°
Hemispheric 30°

C. Linearity.

- Linearity: 0.03 dB